JOURNAL

OF THE

ME CVII, NUMBER 822 SEPTEMBER 1945 TABLE OF CONTENTS, PAGE II

Journal
of the
American Veterinary Medical Association

600 S. Michigan Ave., Chicago 5, Ill.

VOL. CVII SEPTEMBER, 1945 NO. 822

Leptospira in Bovine Icterohemoglobinuria

HADLEIGH MARSH, D.V.M.
Bozeman, Montana

IN THE PAST ten years, icterohemoglobinuria has been reported a number of times as occurring as an enzoötic disease in herds of cattle. In 1933, Schofield[1] described a hemoglobinuria in dairy cows in Ontario, which he ascribed to the effect of the hemolytic toxin of *Clostridium welchii*, developing in the intestine. In 1936, Rose and Edgar[2] described an icterohemoglobinuria of dairy calves in Australia, which they believed to be an enterotoxemic jaundice caused by *C. welchii*, type A, in the intestine. These authors, however, in 1941, state that further work failed to confirm this conclusion. Mahaffey, Bennetts, and Flood[3] reported this condition in dairy calves in western Australia, with etiology undetermined. In 1942, Brite[4] reported a bovine hemoglobinuria in Kansas, affecting cattle of all ages, the cause of which was undetermined. Smith,[5] in 1943, described an "idiopathic hemoglobinemia" occurring in beef cattle in Oklahoma, involving all ages, with a morbidity of 5 per cent to 35 per cent and a mortality of practically 100 per cent.

All the reports referred to above have differentiated the diseases described from bacillary icterohemoglobinuria caused by infection with *Clostridium hemolyticum*, and from preparturient hemoglobinemia of dairy cows.

Jungherr[6] recently described 3 cases of leptospirosis in mature dairy cows, which is apparently the first report of bovine leptospirosis in the United States. He refers to publications by several Russian authors (Michin and Azinov,[7] Michin, Azinov, and Salikov,[8] Vishnevskii,[9] Semskow,[10] Awrorow,[11], Terskikh[12]) on bovine leptospirosis, characterized by icterohemoglobinuria. The symptoms and lesions described in the Russian publications seemed to correspond closely to those described in some of the reports on icterohemoglobinuria of unknown etiology, particularly those from Australia.

During March, April, May, and June, 1944, a breeder of purebred Hereford cattle, in southeastern Montana, lost 25 calves with a disease characterized by rapid fatality and hemoglobinuria. The calves were approximately 2 months old when the disease developed. The owner reported sickness with red urine in several other calves which recovered. During the same period, he reported temporary red urine in 2 or 3 mature cows. Dr. Goodfellow, of Sheridan, Wyo., saw 2 of the fatal cases, and reported icterohemoglobinuria. Two visits to the ranch were made by members of the staff of the Montana Veterinary Research Laboratory, but no cases were available.

On June 11, the owner brought to the laboratory a calf which had been dead about twelve hours when received at the laboratory. Autopsy showed a general icteric appearance. On opening the body cavities, there was a peculiar pinkish appearance of the serous coats of the abdominal organs and of the pleura and peritoneum. This was probably the result of hemoglobinemia. The liver appeared normal externally, but on section there was a slightly yellow color. The spleen was slightly enlarged. The kidneys were dark,

From the Montana Veterinary Research Laboratory, (Montana Experiment Station and Livestock Sanitary Board, coöperating). Paper No. 99, journal series, Agricultural Experiment Station, Montana State College, Bozeman.

with numerous irregular-shaped petechiae. The bladder was distended with a clear red urine, but there was no cystitis.

Smears of the blood and of spleen pulp were examined for anaplasma or other protozoan blood parasites, with negative results.

Aërobic and anaërobic cultures were made from the heart blood, liver, spleen, kidney, bladder, and intestinal contents. Cultures from the spleen, kidney, and bladder developed no bacteria. Cultures from the heart blood developed *Clostridium septicum*, which was considered to be of no etiological significance. Culture from the liver developed *C. welchii*. *C. welchii*, type A, was present in abundance in the ileum. *C. hemolyticum* was not found in any cultures.

Sections of the liver showed that the liver cells, in general, were normal in appearance. There were, however, small foci of partial necrosis, in which there was degeneration of the cytoplasm and some karyorrhexis. In one place in the sections studied, there was a sinusoid distended with a mass of polymorphonuclear leucocytes, and leucocytes were scattered throughout the section singly and in small groups. There was slight hyperplasia of the periportal connective tissue, and some monocyte infiltration into that tissue.

Sections of the kidney showed extensive degeneration of the cytoplasm of the epithelium of the tubules, which may have been at least partially *post mortem*. The nuclei were intact. There was some cytoplasmic degeneration in the glomeruli, and many of the nuclei were angular in shape. The section studied showed a small area where the proximal convoluted tubules were plugged with leucocytes. No hemorrhage was noted, but in the medulla there were many areas in which the capillaries were engorged with partially broken-down red cells. Scattered throughout the cortex, there were deposits in the epithelial cells of an amorphous yellow-brown material which gave a negative test for iron, and was probably bilirubin.

As the pathological condition in this calf resembled the icterohemoglobinemia and hemoglobinuria in sheep, which has been shown by Boughton and Hardy,[13] and by Australian workers, to be the result of copper poisoning, determination of the amount of copper in the liver was made by Dr. Leon Johnson of the Chemistry Research Department, of the Montana Agricultural Experiment Station. The amount of copper was found to be 30.6 μg. per gram, as compared with 71.7 μg. per gram in a liver from a normal calf, examined as a control. Both these amounts are well within the accepted normal range.

The history of this outbreak and the pathological picture in this autopsy seemed to correspond very closely with the "enterotoxemic jaundice" described by Rose and Edgar[2]. As a type A *C. welchii*, which produced a hemolytic toxin, was found in abundance in the intestine, we obtained a supply of antiserum, which was administered to all the calves under 4 weeks old. No further losses occurred, but this may have been coincidental, as the etiology of the condition had not been definitely established.

After the article by Jungherr[6] on bovine leptospirosis appeared, sections of the liver and kidney of the calf, *post mortem*, were prepared and stained for spirochetes by the Levaditi silver-nitrate method. In the liver sections, a few scattered spirochetes were found, and in the kidney, organisms of the characteristic morphology were found scattered throughout the section, in groups of three to six, in the interstitial tissue between the tubules. No masses of the spirochetes were seen, and it was not possible to correlate the location of the small groups with tissue changes observed in the sections.

The spirochetes observed in the tissue sections corresponded in morphology to the description of Leptospira. As no fresh material is available at this time, no living organisms have been studied.

Although the history, symptoms, and lesions observed in this outbreak do not correspond very closely to those of the 3 bovine cases described by Jungherr,[6] they appear to fit the disease described by Semskow[10] and Awrorow,[11] in Russia, as indicated by an abstract of their publications in the *Veterinary Bulletin;* Semskow[10] describes acute and subacute forms of the disease, affecting principally calves 2 weeks to 3 months old, and characterized by hemoglobinuria, icterus, and pyrexia. The acute form is usually fatal within two to three days, while the subacute form lasts five to nine days and has a mortality up to 50 per cent. He also describes a form of the disease in which hemoglobinuria is the only obvious symptom, which affects both calves and older animals. In the outbreak described here, all the known fatal cases were in calves from about 6 weeks to about 10 weeks old. The mortality in the calves was about 90 per cent. The milder form appeared in several cows, which showed hemo-

globinuria temporarily. The pathology described by Awrorow,[11] and quoted by Jungherr,[6] appeared to correspond quite well with the findings here.

SUMMARY

During a three-month period, ending June 18, 1944, 25 purebred Hereford calves on one ranch died of an acute disease characterized by hemoglobinuria. In work with 1 animal, copper poisoning and bacillary icterohemoglobinuria were eliminated in the diagnosis. Finding Leptospira in tissue sections seems to establish the condition as leptospirosis, in the light of Russian work with this disease in cattle, and the recent report of Jungherr[6] on bovine leptospirosis.

References

[1]Schofield, F. W.: Bovine Hemoglobinuria Associated with an Intestinal Infection Caused by the *Cl. welchii*. Ontario Vet. Col. Rep., 1933, Paper No. 29.

[2]Rose, A. L., and Edgar, Grahame: Entero-Toxemic Jaundice of Sheep and Cattle. Aust. Vet. J., *12*, (1936): 212-220.

[3]Mahaffey, L. W., Bennetts, H. W., and Flood, A. F.: Hemoglobinuria of Calves in the Southwest of Western Australia. Aust. Vet. J., *18*, (1942): 205-208.

[4]Brite, Allen: A Baffling Disease of Midwest Cattle. Vet. Med., *37*, (1942): 386-388.

[5]Smith, H. C.: Progress Report on Idiopathic Hemoglobinemia in Cattle. J.Am.V.M.A., *102*, (1943): 352-358.

[6]Jungherr, Erwin: Bovine Leptospirosis. J.Am. V.M.A., *105*, (1944): 276-282.

[7]Michin, N. A., and Azinov, S. A.: Spirochaetal Jaundice of Cattle in North Caucasus. Sovyet. Vet., *10*, (1935): 23-27. (Abstr. in Vet. Bull. 7, (1937): 419.)

[8]Michin, N. A., Azinov, S. A., and Salikov: Morphological and Cultural Characters and Virulence of *Leptospira icterohaemoglobinuriae vitulorum*. Veterinariya, Moscow, *1*, (1941): 51-55. (Abstr. in Vet. Bull. 12, (1942): 531.)

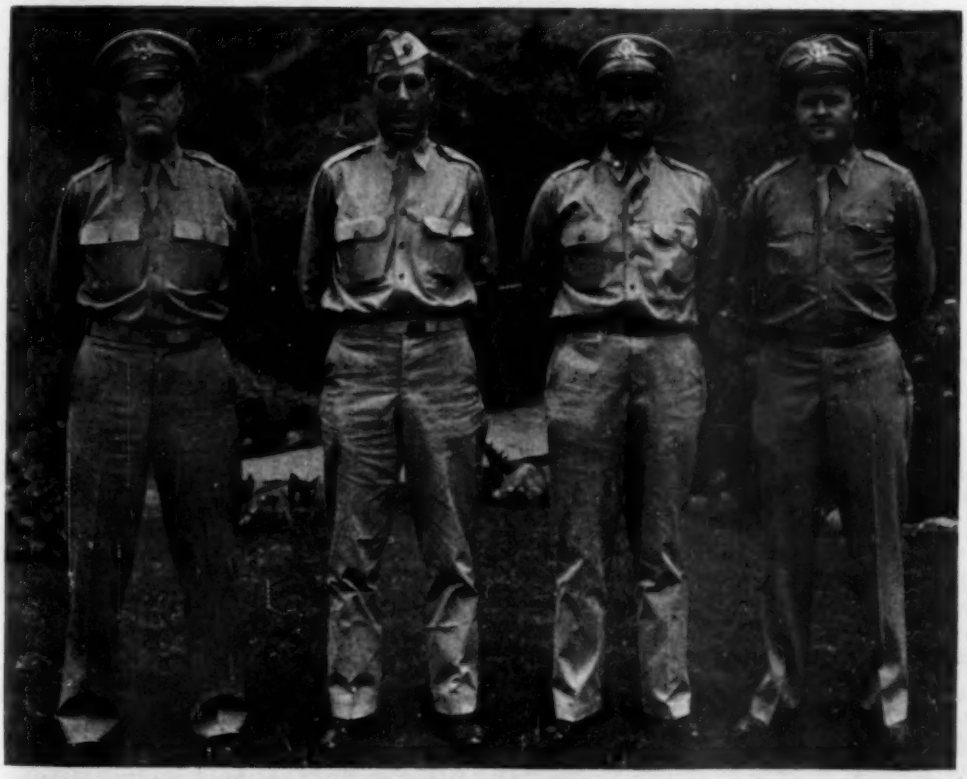
[9]Vishnevskii, P. P.: Rôle of Contact in Spread of Bovine Icterohemoglobinuria. Veterinariya, Moscow, *3*, (1941): 56-61. (Abstr. in Vet. Bull. 13, (1943): 422.)

[10]Semskow, M. W.: Die Aetiologie, klinische Formen und die Epizoötologie des Ikterus infectiosus der Rinder. Ztschr. f. Veterinärk., *53*, (1941): 7-23. (Abstr. in Vet. Bull. 12, (1942): 338.)

[11]Awrorow, A. A.: Einige Ergebnisse der Erforschung der pathologischen Anatomie und Pathogenese des Ikterus infectiosus der Rinder. Ztschr. f. Veterinärk., *53*, (1941): 32-40. (Abstr. in Vet. Bull. 12, (1942): 338-339.)

[12]Terskikh, V. I.: The Etiology of Infectious Icterus Among the Cattle. J. Microbiol. Moscow, *8*, (1940): 66-68. (Abstr. in Vet. Bull. 12, (1942): 207.)

[13]Boughton, I. B., and Hardy, W. T.: Chronic Copper Poisoning in Sheep. Texas Sta. Bull. 499, 1934.



—Signal Corps, U. S. Army.

Chief veterinarians of four commands in the Pacific attend the annual meeting of the Hawaii Territorial Veterinary Medical Association. Left to right—Col. W. O. Kester, V.C. (K.S.C. '31), Pacific Ocean Areas; Lt. Col. J. D. Manges, V.C., (K.S.C. '35), Central Pacific Base Command; Lt. Col. R. H. Yager, V.C., (U.P. '39), chief of the veterinary laboratory service, Pacific Ocean Areas; and Lt. Col. F. L. Molt, V.C., (Tex. '39), U. S. Army Air Forces, Pacific Ocean Areas.

Domestic Fowl — The Tamest of the Tame

EVAN L. STUBBS, V.M.D.
Philadelphia, Pennsylvania

FOWL have been man's benefactor for more than 5,000 years. It is a long flight from the jungle fowl to the domesticated, modern, 300-egg hen. The jungle fowl is credited with being the progenitor of our domesticated chicken. The jungle fowl usually lays two clutches of eggs a season, totaling 22 to 26 eggs. The modern hen that lays 300 eggs in one year is not unusual. The most rapid development in the poultry industry has occurred since the last war through the use of the modern incubator, the trap nest, and the newer knowledge of nutrition in poultry feeding.

The first civilization known was Asiatic. Many species of domesticated animals have come from that eastern continent. Thousands of wild chickens live in the jungles of southeastern Asia. Man in the primitive state wandered. He followed the food supply and lived chiefly by hunting and eating the flesh of animals. Increase in population depended to some extent upon the number of animals and birds within reach.

No direct evidence is known as to when man first domesticated wild animals. It is said that when the Aryans entered India, they were almost entirely a pastoral people, whose wealth consisted of cattle, and who looked upon agriculture as degrading. Village settlements came later and, with increasing populations and the imperative need for mutual protection or the disappearance of natural food supplies within range, nomadic life changed. Cultivation of the soil followed. It was probably then that various species of poultry were domesticated. The food supply became a prime factor. The domestication of small animals and birds by reason of their edible value would seem logical. Then followed control with selection, mating, and breeding. Domestication of poultry was probably comparatively easy. The parent stock could be captured or birds taken alive when young. Even eggs could be collected from wild birds' nests and hatched by birds already tamed. Thus, chickens became the "tamest of the tame", because, even though left unconfined and by necessity forced to forage for their food, they returned to the habitations of man for shelter.

The origin of our present domesticated chickens is not entirely clear. Charles Darwin and others believed that they were derived from one stock, the jungle fowl, *Gallus bankiva*. It may be accepted that the most of our breeds of fowl are descended from the jungle fowl and originated in eastern and southern Asia. The species bankiva has a wide geographical range. It inhabits northern India as far west as Scinde and ascends the Himalayas to a height of 4,000 feet. It also is found in Burma, the Indo-Chinese countries, the Philippine Islands, and the Malay Archipelago as far east as Timor. The species varies considerably in the wild state. The jungle fowl agrees most closely with the black breasted game breed in coloring and in all other respects, except it is smaller in size and the tail is carried more horizontally. Chickens from the eggs of this wild stock are easily tamed.

Poultry has supplied food for mankind for milleniums, long before the ages for which we have reliable records. The hunter used fowl as game to supply provision for his household. Domestication, even though subsidiary to cultivation of the land and the raising of larger animals, made poultry more important. Their nature made them easy to control and they became members of the family. Fowl have contributed to the recreation and pleasure of man, whether by the sport of cock-fighting or by giving play to his creative faculties in respect to evolution of breeds or varieties. They have also contributed to his competitive spirit as expressed in the exhibition system. More chickens are under domestication than any other animal. A great poultry industry has been created. Ample opportunity is present

Reprinted (with minor changes) from *The General Magazine and Historical Chronicle* of the University of Pennsylvania, Philadelphia, under the title "The Tamest of the Tame," at the request of the author and others, in order to give the article wider distribution.

The author is professor of Veterinary Pathology, School of Veterinary Medicine, University of Pennsylvania.

for further development in the ever-increasing consumption of eggs and poultry far in excess of that already attained. Poultry-raising, although simple under primitive conditions in which there is no specialization, is extremely complex when operated commercially on a large scale. Problems have arisen with its development that call for the utmost coöperation of the practician and the scientist.

Poultry-raising through the centuries has been a sideline, chiefly in the hands of women, whether under nomadic or more settled conditions. The distribution of poultry as a result of migration, conquest, intercourse, and commerce, has been widespread. The aggregation of populations in urban and semiurban areas, with commerce and the rise of industrialism, has led to a fundamental change. These massed peoples were, and are, almost entirely dependent upon others for their food supplies. Production must increase under such conditions and the range of supplies must widen. The effects of these changes are seen in the ever-increasing consumption of eggs and poultry.

Poultry, by their small size of body, rapidity of growth, and prolificacy, can be kept by almost anyone, even by those in great centers of population, as back-yard flocks. Farmers, either by their own efforts or those of their womenfolk, have always been, and are, the main sources of supply. Amateurs, cottagers, and urban residents have extended the industry, as have those interested in the improvement of breeding stock and specialization in the production of eggs and poultry as a commercial enterprise. More of the world's inhabitants are interested in poultry-raising in its various branches than in any other form of domesticated animal.

Some can recall the time when the pioneers of the poultry industry were derided and ignored, when to be a poultryman was thought to be the last resort of the incompetent or indolent. That day has passed forever. In many places with dense populations, 10,000 fowl are raised where 1 existed in former days. Poultry, in many places, are an addition and not a displacement of other stock and produce. The gain is greater than represented by poultry alone.

Poultry history is strewn with the wrecks of abandoned theories. Successful poultry-raising requires intelligent men and women with open minds, who are capable of wider views, and who are able to adopt business principles. National and state governments recognize their responsibilities in connection with investigation and, to a lesser extent, in the sale of products. Colleges and institutions associated with agriculture now regard poultry as an equally important sphere to themselves and their constituents, and accord to those engaged as instructors or research workers in this subject the same status as their colleagues. A considerable number of notable scientists have entered the field of research in connection with the multitudinous problems of increasing importance and interest which are presenting themselves to those engaged in poultry-raising.

Poultry-raising is both a science and an art. As a science, it deals with facts, principles, and natural laws underlying the successful raising of poultry. The art is the skill necessary to put these principles into practice. It is possible to imitate one's neighbor's practices and thus unconsciously use scientific principles, but one must have some knowledge and apply it skillfully to be successful at poultry-raising.

The chicken through the centuries made its way into Persia, Palestine, Greece, and England. It appears to have been well distributed throughout much of Asia and Europe by the time of the Christian era. It is believed that Columbus brought chickens to America and it is known that the Pilgrims brought chickens with them. Chickens became well distributed throughout the Western Hemisphere but had little economic value in the early days. The first poultry exhibition was held in Boston in 1849. Following that, much interest was shown in exhibits. Ideas were exchanged regarding breeding, new breeds, and new varieties were developed. The large Asiatic docile breeds were imported and mated with native fowl. The chickens would lay a few eggs, sit on the eggs, and raise the brood. While the eggs were being hatched and brooded no eggs were laid and there was poor production. The incubator was devised to control incubation by maintaining temperature, humidity, and ventilation comparable to the hen. As many as 100 eggs could be hatched at one time (now millions can be hatched).

Brooding equipment was also produced to substitute for the hen in providing warmth and shelter. The first baby chicks were shipped by express in New Jersey in 1892. Now baby chicks can be transported by parcel post and airplane all over the world. Previously, eggs were shipped in barrels containing approximately 70 dozen. Then came the 30 dozen egg crate, with much less breakage, which is still in use. Eggs could be shipped more frequently and much more satisfactorily. Hens in the early days laid most in the spring and little in the fall, with great fluctuations, from which both producers and consumers suffered. The marketing of poultry as meat also was difficult in the early days, necessitating preparation when the weather was cool to prevent spoilage. Modern refrigeration has made possible the shipment of eggs and poultry as meat from coast to coast, over mountains, and through deserts without impairment of quality.

The demand for poultry and poultry products has increased enormously. Our population has increased more than two and one-half times within the past sixty years. Our annual egg production has increased five times. The chicken is well distributed in all parts of the United States but there are regions of great concentration. Cheap feed, nearness to large consuming centers, and favorable climatic conditions influence this concentration. The Middlewest, the grain basket, growing corn, chief feed for the chicken, produces the greatest quantities of chickens and eggs. The large consuming population of the East makes a ready, nearby market for fresh products. Thus, centers of poultry production are found in the Northeast and the East. The Pacific Coast section also is a great producing area and cannot consume all the poultry and eggs produced, so must depend on shipping to the East. No other kind of livestock has such wide distribution on farms in the United States as poultry. Poultry-keeping has grown from a very small beginning to a major industry within a short time.

Poultry was first included in the farm census in 1880. It has steadily increased in numbers and importance since that time. The greatest increase followed the First World War. It is generally recognized that during that war the American hen saved the day for hundreds of thousands of farmers. Farmers at that time, through crop failures, shortage of labor, and low prices were unable to carry on from the income of their normal crops. They were able, as a result of increased revenue from the poultry flocks, to successfully weather the war period and the reconstruction days thereafter. In the years 1920 to 1924, the increase in chickens was 43 per cent and the increase in egg production was 20 per cent.

Twenty-five years ago it was difficult, if not impossible, to raise chickens in confinement. No known substitute was available for sunlight and access to the soil. Vitamin D was unknown. Scientists had not yet dreamed of riboflavin and vitamin K. It was not known that manganese was essential in the ration of the chicken. Subsequent developments revealed more about the quantitative nutritive requirements of poultry than was known about those of all other classes of livestock together. The effects were revolutionary.

Poultrymen found that chickens could be raised in confinement if they received cod liver oil in their ration. Egg production became controllable and was no longer seasonal. Broilers could be produced every month of the year. Poultry investigators revealed much about the vitamin B complex. This led to a knowledge of nicotinic acid in the prevention of pellagra. Nutrition studies in chicks showed that there is more than one kind of vitamin D and that the several kinds are not equally effective in all species. This knowledge had a direct application to human nutrition. Investigational work in chicks resulted in the discovery of vitamin K, the antihemorrhagic vitamin. A condition was described with large hemorrhages and anemia. This was found to be due to a dietary deficiency which later was identified as vitamin K. This vitamin has been found valuable in preoperative treatment for the prevention of postoperative hemorrhage in surgical operations in the gall bladder and bile ducts.

The work in nutrition further emphasized the value of poultry as human food. Poultry, like other meats, is valuable for its protein, since protein is an essential body building material. It is a good source of phosphorous and iron. Poultry also contains riboflavin, thiamin, and nicotinic acid.

The American hen is a great national asset. She is the producer of one of our most wholesome and universally used hu-

man foods, eggs, to say nothing of the great volume of poultry meat. The American hen is a creator of wealth. She is found in ever-increasing numbers on practically every American farm, and is one of the most universal sources of farm income. The chicken is a most economical producer of human food. There is no animal on the farm that more efficiently manufactures a finished product, from the raw material consumed, than the hen. A little Leghorn hen, weighing around 4 lb. if well bred and well managed, will produce in a year a product outside her own body in the form of eggs weighing from 25 lb. to 30 lb. She will consume 75 lb. to 80 lb. of feed to do this. Truly a wonderful machine!

The chicken is a universal favorite. It is well recognized that a far greater number of persons are interested in, and actually concerned with, poultry than any other animal industry. The back-lot poultry keeper, the farm poultry-raiser, the commercial egg farmer, the exhibition and commercial breeders, the baby-chick producer, and the broiler raiser, are but a few of the groups that swell the ranks of the poultry fraternity. The chicken may be a safeguard of the future. As our population continues to increase and tends to herd itself more and more into large cities, and as our cheap grazing lands continue to disappear, we must, as a nation, look more and more to the small animal unit as a source of our food supply. Our people must, of necessity, make poultry meat and eggs an ever-increasing part of their daily diet, if for no other reason than that poultry husbandry lends itself to intensive methods and limited areas.

The American hen is the producer of one of the greatest food products that has ever come down the ages. The egg is one of our greatest protective foods, being rich in the more important vitamins. Its greater use in the diet of old and young alike insures complete nourishment of the body and protects the human organism against certain important nutritive deficiencies.

An egg a commonplace! Only if we fail to learn its worth. Then it becomes a marvel—one of the finest contributions a wise Providence has bestowed upon unseeing, unthinking mortals. The age-old conundrum of which came first, the egg or the hen, grows insignificant when we consider how so much goodness could be stored in a 2-oz. package within such a marvelous protection as the shell.

Humpty dumpty sat on a wall,
Humpty dumpty had a great fall
All the King's horses and all the King's men
Couldn't put humpty dumpty together again.

Defying all the King's horses and men to repair its shell, dust and tamper proof, the egg holds essential foods of life. The egg meat comes to us wrapped in a sealed container, the contents of which are untouched by the hand of man. Truly a wonderful work of nature—truly a marvelous food product!

Today's grandmothers knew, when their babies were growing up, that the egg was a fine source of excellent proteins and fats, but they knew very little of minerals and vitamins. Egg-tarnished silverware told of the presence of sulfur. Sulfur serves the bloodstream as a good broom serves the housewife, sweeping clear impurities. The sulfur of an egg yolk can be used by the body, but the sulfur-and-molasses spring tonic of grandmother's day was heroic but futile, since the body cannot use sulfur in such form.

We are told that some sixteen elements combine to form the body, and within a 2-oz. egg we can find twelve of these elements. Iron, phosphorus, and calcium are foremost, with traces of iodine, sodium, fluorine, chlorine, magnesium, oxygen, silicon, manganese, and sulfur, each in a form readily available for the use of the body. Good bodily health requires the presence of about 75 gr. of iron. The loss of but 25 gr. produces a health hazard. One egg supplies 10 per cent of the body's daily requirement for iron. Babies are born with a reserve of iron, but living on milk, this iron reserve is often used up and it has been found that egg yolk has the finest source of iron for babies.

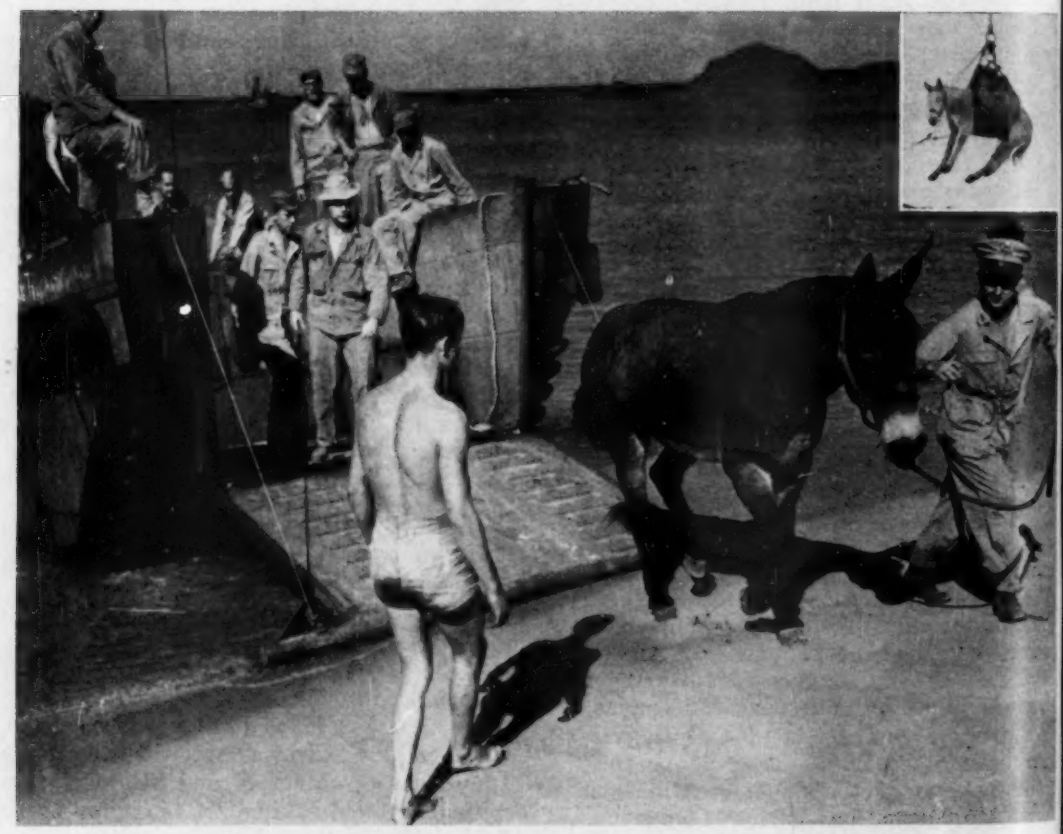
Strong, sturdy bones and teeth require calcium, phosphorus, vitamins C and D. Milk is the finest source of calcium but eggs contain calcium too. Eggs contain three times as much phosphorus as fresh, whole milk. Modern nutrition, with its knowledge of minerals and vitamins, has routed that old saying, "a tooth for every child". The mother's teeth are safeguarded, and the baby's bones and teeth are assured a healthy start if the prospective mother includes plenty of milk and eggs for cal-

cium and phosphorus, and generous helpings of fresh fruits and vegetables for vitamin C in her diet. Eggs are a rich source of vitamins A and vitamin D. Most foods ordinarily consumed by man are devoid of vitamin D. Traces of this vitamin are found in milk and butter produced during the summer months, but with the exception of fish oils, egg yolk is the only natural foodstuff containing appreciable amounts of vitamin D.

Nature is a great chemist. An average egg weighs but 2 oz., yet it is crammed full of many food elements absolutely essential to health and well being. Man, in all his great achievements, has never approached the perfection found in the 2-oz. egg. With naught but heat added, Nature produces from the egg a living organism—sufficient proof that it contains every element of life.

The newest processing methods for eggs are freezing and drying. This comparatively new business has grown in mushroom fashion. China started to freeze and dry eggs in a larger way than was done here until recently. Large quantities of frozen and dried eggs were imported from China. This was because the Chinese farmer receives from two to three cents per dozen for his eggs. The production of dried eggs, in the United States during 1941, was more than ten times larger than in any previous year. This was due to demands for the Lend-Lease program and, during October, 1941, 10 million lb. of dried eggs were purchased. It is estimated that there are some sixty egg-drying plants now with an estimated capacity of 160 million

Army Mules in Amphibious Operations



—Signal Corps, U. S. Army.

Mules are trained in the ways of amphibious operations on a Middle Pacific Ocean Island; they may be discharged from animal transport ships by slings (see inset) into smaller landing craft which bring them ashore. If landing craft are not available, the animal may be placed in a sling and lowered into the water for a swim to shore.

lb. annually. This compares with the all-time high production of 10 million lb. prior to the war. It takes about 32 lb. of fresh eggs to make 1 lb of dried eggs.

Among chickens, there is social status too. This social or peck order is based on the pecks given and received by an individual, and the social position of each is determined by the number of birds it pecks. The dominant bird pecks all in its flock, and the bird lowest in social order is pecked by all.

The peck order is relatively stable. When strange birds are brought together, fights occur until a decision is reached or there is passive submission. A beaten bird will thereafter avoid any individual to whom it lost in the introductory contest. The peck may be undelivered and constitutes a threat. Chickens at the top have free run and exercise domination, particularly at feeding time. Pecks are most frequently given at feeding time and rarely when roosting.

Egg and poultry consumption in 1943 was at record levels. Apparently, there will be a demand for all that can be produced in 1944. Available figures indicate that during 1943, there were produced in the United States 925,652,000 chickens, 248,576,000 broilers and 4,516,000,000 dozens of eggs. The sale of poultry and eggs by poultry-raisers on the farm totaled $2,322,000,000. The Seventh World's Poultry Congress and Exposition was held in the Cleveland Auditorium in 1939. At that time, it was commonly stated that the poultry industry was a billion dollar industry. It is now a 2 billion dollar industry and has, therefore, doubled in value in the last five years. Truly a wonderful vocation!

Takes a Look at Britain

G. M. Clemons, secretary-manager of the Holstein-Friesian Association of Canada (*Holstein-Friesian World*, May, 1945), after taking a look at the food situation in Great Britain, remarked that "The feeding of the people of Britain in wartime has been a tremendous task," a task that has forged new bonds between the British and Canadian farmers. In this, the record of the British farmer must not be overlooked. When his country was confronted with severe shortages, especially of protein feeds, it was organized (regimented) as never before. The government told the farmer what he should grow and he grew it. Subsidies were paid for growing the less profitable crops that were needed. Though this sounds like dictatorship, it fell to the War Agricultural Committee to see that it was done. The Committee went over each farm with the owner and determined how much of each crop would be grown, making as little change in the regular routine as possible. The crops and livestock were thus fitted into a master plan for maximum production. Pastures were turned into crop land, parklands were plowed, and derelict farms put to work; all this in the face of innumerable acres needed for the airfields and dispersal areas that blanketed the whole country. Farmers have admitted that the compulsory program increased the production of their acres. Mechanized tillage increased and milking machines came into more general use. The Women's Land Army, in uniform, became a vital part of the war effort. The program included wage adjustment for farm labor, price regulation for agricultural products, and the siphoning off of excess profits.

One of the major steps in this connection is the operation of the Milk Marketing Board which purchases all of the milk in England and Wales, pays the producer monthly, and sees to its equitable distribution among the people as fluid milk, butter, cheese, milk powder, etc. The allowance for adults (as of April, 1945) was two and a half pints per week with an additional half pint for children. An increase in the allowance was expected. A sidelight of the Milk Marketing Board's undertakings is artificial insemination at sectional stations, established to increase animal production.

The picture is a rude shock to the North American who has little felt the hardships of the war, and also is a striking lesson in the power of democratic government. Although in Britain and Canada, government regulation is more often criticized than praised, it was surprising to find almost universal approval of Britain's dictatorial policy in the management of its agriculture.

As the dimension of arable land is unchangeable and the increase in populations complicates the problems of health and subsistence, veterinary science is gravely concerned over the poundage of food each acre can be made to produce. As the work of the British veterinary service is kept in the background in this thesis, one wonders what gains would have been made in the absence of its operations.

Gleanings from Committee Reports

(Presented at the Chicago Business Session, Aug. 20-22, 1945.)

Education.—The Committee appreciates that there is a lack of modern and authoritative books treating of various phases of veterinary medicine; that many older books need revision; and that there is a growing need for new books —many on subjects that have not heretofore been provided for. Revising and publishing old and new books has been studied.

• • •

Therapeutic Agents and Appliances. — Three agents are considered to be of no value for the purpose specified, and the Committee suggests that the listing of these items be discontinued in veterinary supply catalogues. They are *sulfocarbolates* or *phenolsulfonates* for intestinal antiseptics; *kamala* for expulsion of tapeworms from fowl; and *formaldehyde* for treatment of mastitis in cows.

• • •

Public Relations.—Too many people still do not know of the various ways in which they are being served by veterinary medicine. The rationing of such staple articles of food and clothing as meat, butter, cheese, and leather shoes has made most people conscious of the importance of the livestock industry. But it is not known, generally, that the welfare of the livestock industry depends on how well veterinary medicine controls the diseases of animals.

• • •

Registry of Veterinary Pathology, Army Institute of Pathology.—Although this new registry has been in operation for less than a year, material representing 500 cases has been acquired, and new material is arriving daily. The number of animal hospitals taking advantage of the diagnostic service is steadily increasing. Lantern slides are being distributed for teaching and for special lectures and demonstrations.

• • •

Rabies.—The Committee recommends the identification of all dogs, with impounding and disposal of all unidentified (stray) dogs; special concessions for dogs officially immunized; veterinary supervision over exposed or suspected animals; and issuance of health charts which carry information for proper guidance of the veterinarian on the receiving end of the shipment.

• • •

Milk Hygiene.—The objects of the Committee are to stress the importance and necessity of the physical examination of all dairy animals; to draw up a standard uniform procedure for such examination; and to show the benefit to the dairyman, to the dairy industry, and to the consumer.

Brucellosis.—All permanent progress in handling brucellosis must be recorded in terms of increasing numbers of herds free from the disease. Calf vaccination prevents some brucellosis; it delays some; and it softens the effect of some that actually occurs. There is yet much to learn regarding adult vaccination, and any cattle breeder contemplating use of adult vaccination should have the proper information in writing.

• • •

Sheep Diseases.—A discussion of the disease problems of sheep falls naturally under three headings; the problems of the farm flock, the range flock, and the lambs in feedlots. Under each head a number of conditions is listed for the purpose of stimulating the interest of feeders and veterinarians.

• • •

Swine Diseases.—Infertility of brood sows is an important factor in swine production. Much of this could be avoided if breeders would select thrifty gilts from large litters of good-sized pigs and would mate only animals that are not too young. Swine brucellosis and a number of other disease conditions are also discussed.

• • •

Diseases of Wild Animals.—Rabies has been occurring in such frequent outbreaks in wild carnivores that some workers in wildlife conservation have concluded that it is constantly present in some areas and periodically assumes epizoötic proportions in foxes, coyotes, and other animals.

• • •

Motion Picture Library.—Film could be secured only in very limited quantities, but definite progress has been made in setting up a basic library which will expand quickly when military demand for film relaxes. The Library filled requests for film for 21 occasions during the year.

• • •

Postwar Planning.—Results of a questionnaire sent to men in service indicate that 58.5 per cent of the veterinary officers expect to practice upon release from military duty. Further study of internships is recommended. We must establish a goal for the veterinary service which we will be rendering ten years from now.

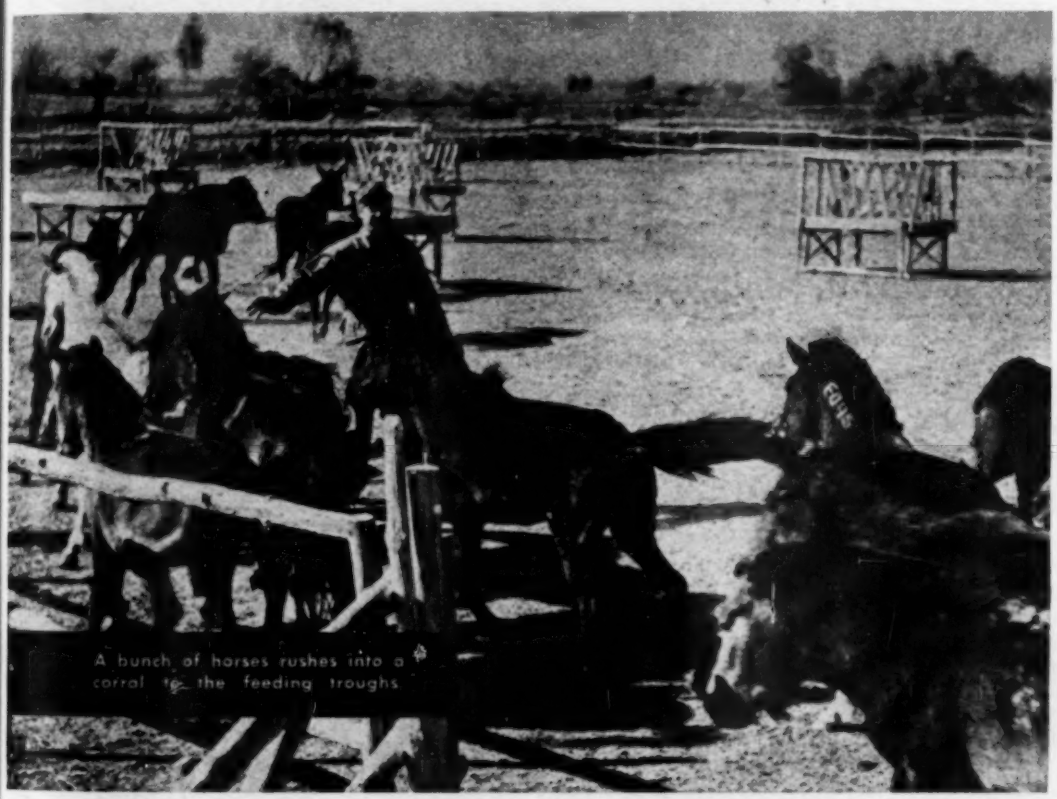
• • •

Food Hygiene.—This Committee has actively engaged in an attempt to have meat inspection taught by a staff member with at least three years of experience in the Federal Meat Inspection Service, and in the formulation of an ideal code or ordinance covering meat inspection to be adopted by municipalities.

The Horse Traders of the U. S. Army

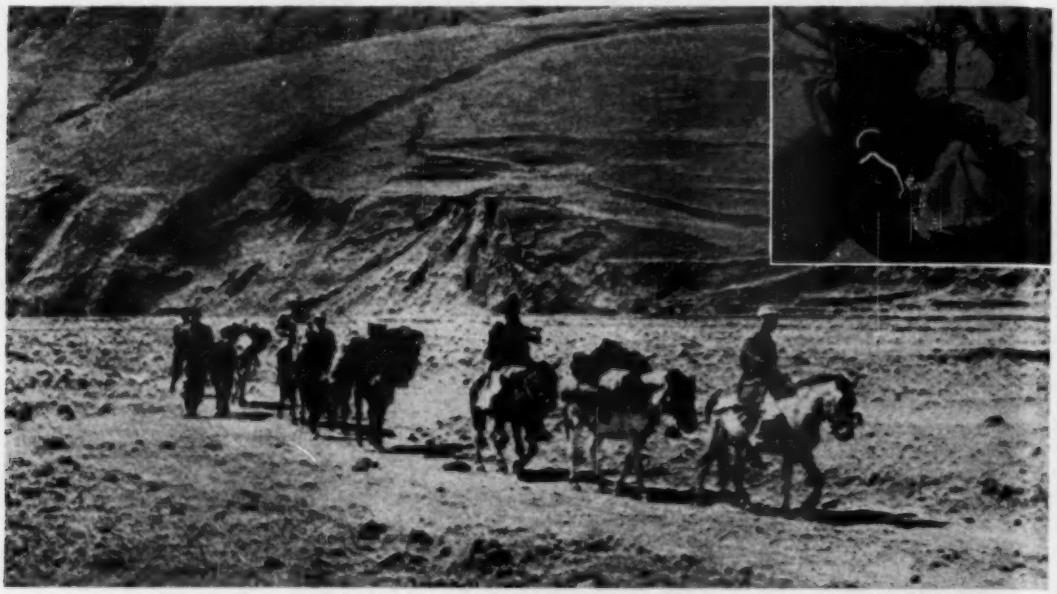
When General Patton, blitzer supreme of the African and European campaigns, said that American soldiers could make the "orneriest" jeep listen to reason anytime, anywhere, but couldn't saddle a horse, apparently he had not heard of the GI's in the Pacific theater, who are not only reported officially to have given a good account of themselves *vis à vis* the cleverest swindlers of the Oriental horse markets but who also trained the mounts and the mounted men needed to keep the troops moving in the most difficult land operations of the war—the China-Burma-India campaign which reopened the Ledo-Burma highway to China.

Col. Daniel H. Mallan (Corn., '17), V.C., U.S.A., Harrisburg, Pa., and Major Charles D. Ebertz (Corn., '35), V.C., A. U. S., of Auburn, N. Y., are complimented in the Army publication, *Yank*, of July, 1945, for the horse-buying sagacity they displayed in the procurement of animals from the hard-boiled Tibetans "who'd rather fight than eat," and whom they found hard to separate from their horses and mules simply for money. They preferred silver blocks or real property. Sometimes money was no good at all, and the barter goods they asked for were a bit inconvenient to obtain. Yellow felt hats were the last Tibetan fancy—for one of which they would trade their best horse. The inset shows Major Ebertz at the age-old act of cutting out the superannuated soliped. The job ahead required youth in men and animals. The vet-



—From Yank, July, 1945

Horses purchased in Lololand (Tibet) for the China-Burma-India campaign which led to the reopening of the Ledo-Burma road. These animals were purchased in Tibet by American veterinary officers and trained as pack animals for arduous transport work over difficult mountain terrain.



—From Yank's Staff Correspondent, Cpl. Jud Cook

A pack train, of the Far East theater, made up of horses purchased in Tibet by veterinary officers and trained by them in China. Inset—Major Charles Dexter Ebertz, of the Veterinary Corps, getting at the age of a costly mount. When these animals were shod, the job fell to T-4 Norman Skala, horseshoer, of Elgin, Ill.

erans of Antietam, San Juan Hill, and Argonne-Meuse have fascinating fireside tales to relate but these will fade from memory when the sagas of the GI horse traders in Tibet get written into the veterinary history of World War II. What a war! We are indebted to Major R. T. Gilyard for the information.

—Signal Corps, U. S. Army.

Major Charles R. Smit, V.C., of Alton, Iowa, Army veterinarian on Saipan, exhibits a bull typical of the animals used for draft purposes by the Japanese in the Marianas. Army veterinarians supervised the handling of these cattle, which were tested for tuberculosis and brucellosis. All reactors were slaughtered for food, but few cattle were found to be diseased.

—Signal Corps, U. S. Army.

Major Clifford W. Turner, V.C., (front) of Chico, Calif., treating captured Japanese cattle on Tinian with DDT. All animal management and disease control are under the supervision of Army Garrison Force veterinarians.

The Immunization of Foxes and Dogs to Distemper with Ferret-Passage Virus

R. G. GREEN, M.D. and W. E. CARLSON, B.A.
Minneapolis, Minnesota

A VARIETY of animals of the canine and weasel families are highly susceptible to distemper and, as almost every susceptible species appears to require a special vaccine or serum, the immunization of animals to canine distemper is a problem of great complexity. Most investigations of distemper have been directed toward the disease in dogs. In recent years, expansion of the scope of distemper research has been invited by the fact that a number of fur-bearing animals, in addition to the ferret or fitch, have been brought into captivity —in particular, foxes, raccoons, and mink. These animals, which are highly susceptible to distemper, are maintained in large numbers on specialized ranches or farms. The investigations reported in this paper concern principally the fox and the dog, although the general study includes other species.

The fox and the dog are closely related species belonging to the family Canidae. They have a similar disposition to distemper and in distemper studies may generally be considered a unit. In our development of ferret-passage virus as an immunizing agent, we have used chiefly the fox in determining the virulence of the virus. In studying the production of immunity by the ferret-passage virus, we have generally used the dog.

HISTORICAL

Modern work on distemper as a virus infection dates back to Carré,[1] who demonstrated that the disease in dogs is caused by a filterable virus. The findings of Carré were quickly disputed by Kregenow[2] and confirmed by Lignières.[3] The latter had previously believed that an organism which he had isolated was the cause of distemper. The eclipse of Carré's findings by the later investigations of Ferry[4] and of Torrey and Rahe,[5] who sought to demonstrate that the disease was a bacterial infection, was unfortunate. However, years of effort in attempting to control distemper by means of the bacterial vaccines which resulted from their work finally began to convince investigators that all claims for the bacterial causation of distemper were in error.

Shortly after 1920, several research projects designed for study of the nature of distemper and methods of immunization arose almost simultaneously, notably those of Puntoni, Laidlaw and Dunkin, and Lebailly. Our distemper studies also originated at that time. All of these investigations were directed toward establishing the fact that distemper was or was not caused by a filterable virus and toward developing a vaccine. Puntoni,[6] the first of the later investigators, appears to have had an extremely broad and logical viewpoint as regards the distemper problem. In advance of the others contemporary with him, he established a virulent distemper virus in dogs by serial transmission, utilizing intracranial inoculation. He introduced the first distemper vaccine comprised of distemper tissue treated with formalin; and his method of producing vaccine was subsequently utilized by Laidlaw and Dunkin as well as by Lebailly. Puntoni even anticipated in his views the results of our investigations, which were to have their fruition twenty years later in the modification of the distemper virus by animal passage. Puntoni stated: "Immunizing remedies in the field of filterable viruses, and especially of these clamidozoi, have preceded those in the field of bacteriology proper. I may cite as an example the Jenner vaccination in smallpox and the Pasteur vaccination against rabies. The so-called clamidozoi seem to be microorganisms susceptible to very easy modification and attenuation so as to permit the preparation of attenuating vaccines which are highly efficacious in immunization and are not dangerous. It was for that reason that we were justified in hoping to obtain

Medical School, University of Minnesota, Minneapolis (Green), and Fromm Laboratories, Inc., Grafton, Wis. (Carlson).

an antidistemper vaccine." Puntoni identified his distemper viruses by the presence of the cytoplasmic inclusions (bodies of Sinigaglia) in the cells of the intestinal mucosa. The killed virus vaccine which he prepared from formalized brain tissue, although used only on a small scale, must, even today, be classified as a successful immunizing agent.

In 1923, Laidlaw and Dunkin[7] began a systematic attack on the distemper problem which continued for a period of ten years. Their work has won renown because of its extent and thoroughness, and because it was carried to conclusions that could be brought to practical use. They introduced the ferret into distemper research and utilized it extensively in experimental work. After demonstrating again that distemper was due to a filterable virus, confirming the work of Carré, Lignières, and Puntoni, they adapted Puntoni's vaccine to the immunization of ferrets. They developed a vaccine consisting of formalized ferret spleen tissue and demonstrated that this vaccine could be used to immunize ferrets but not dogs. At the same time, Lebailly[8] described his vaccine for dogs, composed of formalized dog spleen. Laidlaw and Dunkin then prepared a similar vaccine from the spleens of dogs, following the pattern they had used in their work on immunization of ferrets. They studied the immunity produced in dogs by the use of formalized vaccine and, finding it to be relatively short-lived, devised their final vaccine-virus method in which a dog received a dose of killed virus followed in ten days by a dose of living virulent virus. Finally these investigators developed the anticanine distemper serum made from hyperimmunized dogs. This has found wide use in the treatment of canine distemper, and in the protection of young dogs by passive immunity.

Our investigations on distemper[9], begun in 1924, were directed primarily to the study of distemper in silver foxes. The fox distemper problem was complicated by the presence of other unknown diseases, which simulated distemper and which sometimes were complicating diseases in distemper epizoötics. Our distemper investigations were forced into a digression and became concerned with a disease we have called fox encephalitis and one that we have termed Chastek paralysis. Fox encephalitis[10] was found to be a virus disease similar in some respects to canine distemper. A hyperacute form of canine distemper, which DeMonbreun[11] later described as occurring in dogs, was undoubtedly this infection. Chastek paralysis[12] was determined to be a thiamine deficiency in foxes caused by the destruction of this vitamin by the inclusion of fresh raw fish in mixed fox feed. The manner in which these diseases complicated the study of distemper in foxes was well illustrated on one of the fox ranches forming the basis of our study, in 1936, when the herd suffered simultaneously from distemper, fox encephalitis, and an acute outbreak of Chastek paralysis.

REQUIREMENTS IN FOX HERD VACCINATION

In our attempts to perfect measures to control canine distemper in foxes maintained in captivity for the production of fur, the work of other investigators, described previously, was drawn upon. The killed-virus vaccines, as prepared for dogs, were found inefficient and too expensive for large-scale use on fox farms. Killed-tissue vaccines made from the tissues of foxes, likewise, were found ineffective and excessively expensive. Hyperimmune serum made from dogs was found to retard the progress of an epizoötic of distemper in foxes, and to reduce the mortality somewhat. However, it proved entirely unsatisfactory for the control of distemper epizoötics. Hyperimmune serums prepared from foxes were of somewhat greater value but still were far from being an effective tool in combating distemper outbreaks in fox populations.

Approaching the problem exactly as Puntoni did, we believed that, in view of the requirements of fox ranchers, an attenuated vaccine such as that used for smallpox was most desirable. This line of endeavor seemed to hold out the possibility that a vaccine could be produced which would not be prohibitive in price, a single dose of which would be sufficient to produce a long-term immunity. Our first attempt to modify a distemper virus was undertaken in 1934, but this came to naught because of a loss of facilities for carrying on the work. A second attempt was begun in 1935. As a detailed description of the modification of distemper virus by ferret passage has al-

ready been published[13], the procedure is only briefly reviewed here.

MODIFICATION OF THE DISTEMPER VIRUS BY FERRET PASSAGE

Preliminary work in selecting a virus for modification by ferret passage included the isolation of many strains of the distemper virus from epizoötics in foxes. By means of cross-neutralization tests and cross-protection tests, it was ascertained that all distemper viruses obtained from foxes were immunologically identical with the strain of distemper virus furnished to us by Laidlaw and Dunkin, and likewise identical with that utilized in the United States by various biological companies for the production of distemper vaccines and serums. The strain of virus that we chose for modification was highly pathogenic for foxes, dogs, and ferrets. It was injected subcutaneously into two ferrets, which were killed when they sickened to a stage of extremity. Their spleens were removed aseptically and used as virus for the inoculation of two or more ferrets in the next generation. In this manner, the virus was passed through sixty-nine generations. The decline in its virulence for canines was tested at various times by the inoculation of young red fox pups dug from their dens in the wild and held in quarantine pens before inoculation. A progressive decrease in virulence of the virus for foxes was observed. Injections of virus passed through fewer than 15 generations in ferrets produced an average mortality of 40 per cent in foxes. Test injections of virus between the twentieth and thirtieth generations gave an average mortality of only 15 per cent. Virus of generations above 50 produced a mortality in foxes so low that it could not be definitely determined. At the same time, the virus increased in virulence for ferrets until at 50 generations it produced death regularly in twelve to fourteen days, as compared with the eighteen to twenty days it required in its original state to kill ferrets. Since the virus was changed to a degree that gave a minimum or a fixed length of infection in ferrets, the virus, like the rabbit-passage rabies virus of Pasteur, could be described as a fixed distemper virus. The pathogenic properties of the ferret-passage virus for foxes and dogs have already been discussed in detail elsewhere[13]. Ferret-passage virus of 50 to 69 generations stimulates no visible reaction when inoculated into young foxes. The inoculation of young dogs results in mild reactions, often accompanied by fever and apparent symptoms of one to several days' duration.

VACCINATION OF FOXES WITH FERRET-PASSAGE VIRUS

The ferret-passage virus of the twenty-seventh and various higher generations was utilized in experimental vaccination. While most of the experiments were carried out on red foxes, experimental vaccination was performed in many groups of silver foxes on infected ranches. Most of the experimental vaccinations were combinations of serum and virus, which were found to produce insufficient immunity. As high ferret-passage virus became available, a large amount of experimentation on red foxes with naked virus was not necessary. As soon as it was determined that the ferret-passage virus produced a low mortality as compared with the mortality of a natural epizoötic, the virus could be used as an experimental vaccine in the control of natural epizoötics involving fur farms. No attempt is made here to describe the large amount of experimental work conducted during a period of several years on the use of various generations of modified virus to vaccinate foxes. However, the essential procedures and the results are fully shown in the limited material presented.

SERUM-VIRUS VACCINATION

Using virus of various generations below the fiftieth, we tried out experimentally a great variety of serum-and-virus combinations. Simultaneous injections of serum and virus failed to develop an appreciable immunity. It appeared in general that the canine antiserum, injected at one point in the body, acting in conjunction with the natural defenses of the body, quickly and completely inactivated the ferret-passage virus of lowered pathogenicity, inoculated at another point in the body of the fox. In all such experiments, however, the mortality among foxes treated with serum and virus was lower than the mortality of uninjected foxes upon exposure to distemper. It would seem that a single treatment with simultaneous injections of serum and virus

resulted in the immunity of some animals, probably of the most highly susceptible. It is conceivable that, in highly susceptible animals with little natural resistance, a mild degree of infection is produced before the virus is destroyed by the antiserum. At any rate, it appears that the serum and virus injected, simultaneously, produce a considerable degree of immunity in a small percentage of foxes inoculated.

Our results would indicate that if the mildly pathogenic ferret virus is injected at any interval up to eighteen days after an injection of serum and virus or of serum alone, it is almost completely neutralized and gives little, if any, more immunity than the simultaneous inoculations of serum and virus. However, if the treatment with serum and virus injected simultaneously is followed by an inoculation of ferret-passage virus after an interval longer than eighteen to twenty days, the effect of the serum is lost and an immunity is produced that is due principally to the injection of the naked virus alone. These results are shown in a general way in the following description of an experimental vaccination of two groups of silver fox pups, totaling 189, on a ranch exposed to infection, but not known at the time to be infected with distemper. However, as an epizoötic of distemper made its appearance about the time the vaccination was completed, it could not be determined whether the losses occurring shortly after the vaccination were due to the vaccination or to the natural disease. Nevertheless, certain of the results obtained are seen to be decisive.

One hundred eighty-nine fox pups were divided into two groups, group 1 consisting of 82 animals, and group 2 of 107. On June 30, 1937, all animals in both groups were injected, simultaneously, with 2.5 mg. of fiftieth generation ferret-passage virus and 10 cc. of canine antiserum. Seven days later, all animals received a dose of the fiftieth generation virus without serum. Twenty-eight days after the initial inoculation, group 1 received 5 mg. of naked twenty-seventh generation virus. In the meantime, 1 death from an unknown cause had occurred in group 2. From this time through the summer, active distemper was evident on this ranch and spread through the entire group of fox pups which numbered about 1,000. During the course of this epizoötic, there were entirely different reactions in the 2 groups of experimentally vaccinated animals. Group 1, which received naked twenty-seventh generation virus, remained practically free from distemper in the midst of violent epizoötics throughout the ranch. Two pens of foxes in this group were involved with distemper three weeks after the inoculation, undoubtedly as a result of the injection of naked twenty-seventh generation virus. Of the 5 deaths that occurred, at least 2 were caused by fox encephalitis. Two additional deaths in this group later in the summer brought the total to 7, not more than 5 of which were caused by distemper. Group 2, which did not receive an injection of twenty-seventh generation virus but only the original inoculation of serum and virus, sustained losses from distemper continuously throughout the summer. The 24 deaths in this group were so scattered that they were obviously part of the mortality being caused by the epizoötic of natural distemper on the ranch.

The strain of fiftieth generation ferret-passage virus used in the simultaneous inoculations of serum and virus and in the inoculation of virus given a week later was afterward found to have been contaminated by a wild, virulent virus about the fortieth generation, so that it was in reality a tenth generation ferret-passage virus. It was therefore discarded. In the controls for this experiment, the naked fiftieth generation virus produced a significant mortality, but, in the two main groups of foxes, the virus was neutralized by the serum and produced no immunity of significance. While the single dose of naked twenty-seventh generation ferret-passage virus given later to group 1 did produce some mortality, all foxes surviving were immune to distemper on exposure. From this experiment and many similar ones, we deduced that there is little value in using anti-canine distemper serum in any combination with ferret-passage virus.

VACCINATION OF FOXES WITH NAKED FERRET-PASSAGE VIRUS

As it was being determined, experimentally, that ferret-passage virus might best be used without the concomitant use of serum, opportunities arose for the trial use of the virus in actual control of distemper epi-

zoötics on ranches. During the breeding season of the winter of 1937-1938, distemper appeared in the Bohl unit of Fromm Brothers' fox ranch. The virulence of the Bohl virus was very high; it caused a loss of 45 per cent of the adult breeders and 80 per cent of the pup crop. In early spring, the disease was inadvertently transferred to the main Fromm fox ranch, where there were 4,000 breeders, and where about 8,000 pups were being born. The disease appeared in two different localities on the huge ranch and demonstrated again the high virulence of the Bohl virus, as it usually killed all the pups in a pen, as well as one or both of the parents. Inasmuch as many of the pups were extremely young and others were still being born, consideration was immediately given to an attempt to control the developing epizoötic by use of the ferret-passage virus. A new and uncontaminated strain of fiftieth generation virus had been produced and carried further to the fifty-fourth generation. Preliminary tests showed the virus to have very low pathogenic properties for foxes, but as yet challenge exposure of experimentally vaccinated foxes had not been made. It was decided to use the virus cautiously, and 1,200 fox pups and their parents in the immediate areas of infection were inoculated with 2.5 mg. of the naked virus. After two weeks of observation, a second group of foxes in the adjacent surrounding zone were injected. By the end of the third week, it appeared that no symptoms of disease were produced by the injection of apparently well fox pups with the ferret-passage virus and that the epizoötic was abating. The remainder of the fox pups and their parents, comprising 5,600 pups and 2,800 adults, then were inoculated. In this experimental vaccination, half of the adults and half of the fox pups were injected with serum and virus, followed by a dose of naked virus, the dosage being 5 mg. of virus and 3 cc. of serum. The remaining pups and adults were injected with 2.5 mg. of fifty-fourth generation virus as a single-dose vaccination. Losses in the entire group of 12,000 foxes declined rapidly, and within a period of thirty days from the initial inoculations, losses had dwindled to a few occasional deaths and these were confined to the original areas of the outbreak. A group of about 100 silver fox pups which were too young to be vaccinated at the time the ranch was immunized or which were born after the general vaccination served as a group of controls. When it seemed that the epizoötic of distemper had completely subsided, the disease suddenly appeared among these unvaccinated fox pups. This small group of fox pups suffered a loss of 75 per cent, since vaccination was delayed until the disease had made extensive progress among them. This occurrence demonstrated conclusively that the virus was producing a mild, immunizing infection and that the vaccination was responsible for the control of the distemper outbreak.

When the epizoötic had completely subsided, the total mortality for the group of 8,000 pups was found to be 3 per cent, including normal losses from other causes. The mortality due to the epizoötic of distemper was probably about 1.5 per cent. This large-scale test of the virus seemed to establish that the fifty-fourth generation virus was harmless for fox pups; that vaccination could be accomplished by treatment with serum and virus in combination followed by virus alone, or by a single injection of the naked virus; and that an immunity was produced capable of resisting contact exposure to a most virulent strain of natural distemper.

VACCINATION OF DOGS WITH FERRET-PASSAGE VIRUS

Simultaneously with the preliminary use of the ferret-passage virus in foxes, studies were instituted on its pathogenic properties for dogs. A description of the pathogenic properties of modified virus for foxes and dogs has been reported in another paper[13]. It was determined that, in general, virus of more than 50 ferret passages is of low pathogenicity for dogs. The virus was found to be without neurotropic properties, inasmuch as it produced no symptoms of central nervous system origin upon intracranial injection into dogs.

Following our early experiments demonstrating low pathogenic properties of the ferret-passage virus for dogs, Green and Swale[14], and Green, Carlson, and Swale[15] reported a limited field test of the ferret-passage virus of fifty-third to fifty-sixth generation as an immunizing agent for dogs. The field tests were conducted with

the assistance of a number of veterinarians and yielded results that were very favorable. The reactions were generally mild to moderate and the dogs appeared to be protected against distemper. A further field test of our vaccine was then reported by Stader and Slaughenhaupt[16], who used sixty-third generation ferret-passage virus in doses ranging from 2.5 mg. to 15 mg. Their findings confirmed our observations that a 15-mg. dose produced milder reactions than a 2.5-mg. dose, and that the larger dosage was preferable for the immunization of dogs. Stader and Slaughenhaupt also observed that dogs injected with 15 mg. of vaccine were usually protected against immediate exposure to distemper. The early protection, which we had previously observed in foxes exposed in an epizoötic of distemper, seems due to a kind of cell-block or interference phenomenon[17] described for other virus infections rather than to an immediately developing immunity. This particular aspect of immunization against distemper by the ferret-passage virus has been investigated further by Schlotthauer[18], who inoculated groups of young dogs with 2.5 mg., 7.5 mg., and 15 mg. of our ferret-passage virus and exposed the dogs immediately to virulent distemper. He found that the 15-mg. dose protected a group of dogs exposed immediately to virulent distemper, but the smaller doses did not give immediate protection.

Outlined below is a group of experiments in which the immunity of dogs, experimentally vaccinated with various generations of ferret-passage virus from the fifty-seventh to the seventy-ninth generation, was challenged, at intervals varying from five weeks to five months after inoculation, by exposure to virulent distemper. In most cases, the exposure to distemper was excessive, as may be seen in the following description of the methods used. A highly virulent natural distemper virus was injected into normal dogs. When these dogs, called "exposure dogs," developed distemper, they were placed in the same pen with vaccinated dogs and unvaccinated dogs. In some experiments, the vaccinated dogs were also injected with the same virulent virus used to inoculate the exposure dogs. These vaccinated dogs had a triple exposure: exposure to dogs sick with distemper, exposure to the unvaccinated dogs when they contracted the disease, and exposure by actual injection of a proved virulent virus. When contact exposure alone was depended upon, the exposure was tested and proved by the spread of distemper from the exposure dogs to the unvaccinated dogs.

The dogs in these experiments were immunized with fifty-seventh, sixty-third, and seventy-ninth generation ferret-passage virus. The fifty-seventh and sixty-third generations are referred to as spleen-transfer virus, inasmuch as the serial transfer in ferrets was carried on by means of spleen collected for virus and injected subcutaneously. The seventy-ninth generation ferret-passage virus may be referred to as a skin-transfer virus. This virus was produced from spleen-transfer virus of the sixty-ninth generation by an additional ten passages through ferrets by skin-to-skin transfer. A small amount of virus was injected intracutaneously into a depilated area of skin. When the ferret sickened, a piece of skin at the point of inoculation was removed, macerated and ground, and utilized as virus in the intracutaneous inoculation of the next ferret in series. After ten passages, to the seventy-ninth generation, this skin-transfer virus exhibited pathogenic properties for the ferret somewhat different from those of the spleen-transfer virus. Although the ferrets inoculated with this virus by subcutaneous injection died in twelve to fourteen days, as do ferrets injected with the spleen-transfer virus, they did not exhibit the inappetence and the seyere diarrhea seen in ferrets sick from the spleen-transfer virus. In the following experiments, the immunizing properties of the virus are studied in terms of virus dosage, number of ferret passages, and kind of virus — whether spleen-transfer or skin-transfer.

EXPERIMENT 247 T-1

Vaccination.—On May 19, 1941, 10 dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 5 mg. of fifty-seventh generation ferret-passage distemper virus (spleen-transfer).

Reactions and mortality.—Reactions were mild and satisfactory. There were no fatalities.

Immunity test.—On July 12, 1941, eight weeks after vaccination, the 10 dogs were placed in a pen with 5 unvaccinated dogs and 2 exposure dogs.

The unvaccinated dogs had been kept in isolation at least thirty days prior to the test and were free from infection. The exposure dogs had been inoculated previously with a

natural distemper virus and were showing typical symptoms of canine distemper on July 12. Results of the test are tabulated herewith.

	NUMBER ON TEST	NUMBER SHOWING SYMPTOMS	NUMBER THAT DIED
Vaccinated dogs	10	0	0
Unvaccinated dogs	5	5	2
Exposure dogs	2	2	2

PROTOCOLS

Dog 442 was an unvaccinated dog that had convulsions on Aug. 21, 1941, showing typical symptoms of distemper, and died on August 22. Complete sections were taken and microscopic findings were as follows:

Lung.—Cytoplasmic distemper inclusion bodies in the bronchial epithelium.

Bladder.—Cytoplasmic distemper inclusion bodies in the epithelium.

Kidney.—Cytoplasmic distemper inclusion bodies in the pelvic epithelium.

Liver.—Cytoplasmic distemper inclusion bodies in bile-duct epithelium.

Lymph node.—Cytoplasmic distemper inclusion bodies in macrophages. Central nervous system: Cytoplasmic distemper inclusion bodies in endothelium.

Adrenal, heart, and gastrointestinal tract.—Negative for distemper inclusions.

Microscopic diagnosis.—Canine distemper.

Dog 443 was an unvaccinated dog that showed severe, typical symptoms of distemper on Aug. 26, 1941, and died the following day. Because other dogs on the test destroyed the carcass, it was difficult to obtain material for microscopic study. However, sections of the bladder showed typical cytoplasmic distemper inclusion bodies in the epithelial lining.

Microscopic diagnosis.—Canine distemper.

Dog 529 was an exposure dog that showed typical symptoms of canine distemper on July 12, 1941, and died on July 14. Complete sections were taken and microscopic findings were as follows:

Liver.—Marked fatty degeneration. Degeneration of hepatic cords.

Spleen.—Moderate congestion. Polymorphonuclears.

Heart.—Polymorphonuclears in vascular system.

Central nervous system.—Possible bacteria in meninges.

Lung, adrenal, bladder, kidney, and gastrointestinal tract.—Negative for distemper inclusions.

Diagnosis.—Clinically, distemper. No cytoplasmic inclusions found on microscopic examination.

Dog 530 was an exposure dog that showed typical symptoms of canine distemper on July 14, 1941, and died on July 29. Complete sections were taken and microscopic findings were as follows:

Lung.—Cytoplasmic inclusions in bronchial epithelium. Moderate consolidation.

Tonsils—Cytoplasmic distemper inclusions in epithelium.

Lymph node.—Cytoplasmic distemper inclusions in large macrophages and reticular cells.

Kidney.—Cytoplasmic distemper inclusion bodies in pelvis epithelium.

Spleen.—Moderate congestion.

Adrenal, submaxillary gland, liver, heart, gastrointestinal tract, and central nervous system.—Negative for distemper inclusions.

Microscopic diagnosis.—Canine distemper.

In this experiment, complete protection was obtained in the vaccinated dogs by inoculation with fifty-seventh generation virus. While the vaccinated dogs remained free from symptoms, the 5 exposed, unvaccinated dogs showed definite symptoms of distemper, although 3 eventually recovered. The development of distemper in the unvaccinated dogs proves that the vaccinated dogs had ample exposure. The protocols of the dogs that died established that the disease present was canine distemper, and identified the disease in both the unvaccinated dogs and the exposure dogs. Although similar protocols are not presented in experiments reported hereafter, all dogs dying were studied by necropsy and by microscopic examinations of all important tissues.

EXPERIMENT 247 (T(b)-1

Vaccination.—On July 11, 1941, 23 dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 2.5 mg. of sixty-third generation ferret-passage distemper virus (spleen-transfer).

Revaccination.—On Aug. 11, 1941, thirty-one days after vaccination, these 23 dog pups were again inoculated with 2.5 mg. of sixty-third generation ferret-passage distemper virus of a different lot to determine whether additional dogs would show a reaction upon a second injection. Four more developed an initial, short, abnormal rise in temperature accompanied by slight to moderate symptoms. From this it is concluded that a dose of 2.5 mg. does not consistently establish an immunizing infection.

Reactions and mortality.—Reactions were either moderate but prolonged or not apparent. There were no fatalities.

Immunity Test.—On September 20, six weeks after the second vaccination, the 23 vaccinated dog pups were divided into three groups and placed with 11 unvaccinated dogs and 9 exposure dogs. Results of the test are tabulated herewith.

	NUMBER ON TEST	NUMBER SHOWING SYMPTOMS	NUMBER THAT DIED
Vaccinated dogs	23	0	0
Unvaccinated dogs	11	11	2
Exposure dogs	9	9	3

This group of vaccinated dogs demonstrated complete immunity to a highly contagious and moderately severe type of distemper. All unvaccinated dogs developed symptoms of distemper while the vaccinated dogs remained entirely free of symptoms.

EXPERIMENT 247 T (c)-1

Vaccination.—On Oct. 24, 1941, 35 normal dog pups between 8 and 14 weeks old, of vari-

ous breeds, were injected, subcutaneously, with 2.5 mg. of sixty-third generation ferret-passage distemper virus (spleen-transfer).

Reactions and Mortality.—Reactions were generally mild and satisfactory. One animal died on the sixteenth day after vaccination. From necropsy findings and microscopic study of all tissues, a diagnosis of pneumonia and general bacteremia was made. Definite evidence of a distemper infection could not be established.

Immunity Test.—On March 31, 1942, five months after vaccination, 32 of the 35 vaccinated dogs were placed in four pens with 8 unvaccinated dogs and 5 exposure dogs. Also on this date, the 32 vaccinated dogs and the 8 unvaccinated dogs were inoculated with a natural distemper virus in a dose of 1 cc. of a 5 per cent spleen emulsion given subcutaneously. Results of the test are tabulated herewith.

	NUMBER ON TEST	NUMBER SHOWING SYMPTOMS	NUMBER THAT DIED
Vaccinated dogs	32	0	0
Unvaccinated dogs	8	8	7
Exposure dogs	5	5	5

In this challenge of immunity five months after vaccination, a maximum exposure was obtained. The vaccinated dogs remained free of symptoms, while all unvaccinated and exposure dogs developed distemper. As only 1 of the 13 control dogs recovered, it was demonstrated that inoculation with the sixty-third generation virus produced a very high degree of immunity.

EXPERIMENT 247 T(d)-1

Vaccination.—On Feb. 11, 1942, 31 normal dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 7.5 mg. of sixty-third generation ferret-passage distemper virus (spleen-transfer).

Revaccination.—On Feb. 20, 1942, 7 dogs that had shown no reaction were inoculated again with the same dose and material given before. These 7 animals remained well.

Reactions and Mortality.—The reactions were generally mild and of short duration. Death of one of the dogs on the twenty-fourth day was considered a death from vaccination. The entire group of dogs was moved to outside kennels, where 2 subsequent deaths occurred, on the thirtieth and thirty-eighth days, which were not considered related to the vaccination.

Immunity Test.—On March 24, six weeks after vaccination, the remaining 28 vaccinated dogs were divided into groups and placed in pens with 12 unvaccinated dogs and 13 exposure dogs. Also on this date, the vaccinated dogs and the unvaccinated dogs were injected, subcutaneously, with 1 cc. of a 5 per cent spleen suspension representing virulent distemper virus. Results of the test are tabulated herewith.

	NUMBER ON TEST	NUMBER SHOWING SYMPTOMS	NUMBER THAT DIED
Vaccinated dogs	28	4	4
Unvaccinated dogs	12	12	12
Exposure dogs	13	13	11

In this experiment 4 deaths occurred after the challenge exposure. The finding of distemper inclusions, microscopically, indicated that the death of 3 of the animals was due in part, at least, to a breakdown of immunity. It is undoubtedly significant that these dogs were given a severe test only six weeks after vaccination. The exceptionally high mortality among the vaccinated, unvaccinated, and exposure dogs was probably caused partially by undue exposure to extremely inclement spring weather when the dogs were moved to outside pens for the immunity test. Most of the deaths in the entire group of dogs reported in this paper occurred in this particular experimental group. Under adverse conditions, the vaccinated dogs also received maximum exposure to a strain of virulent distemper virus, by both contact and direct injection.

EXPERIMENT 265 T-1

Vaccination.—On Dec. 4, 1941, 10 dog pups between 8 and 14 weeks old, of various breeds, were injected, intravenously, with 10 mg. of sixty-third generation ferret-passage distemper virus (spleen-transfer).

Reactions and Mortality.—Reactions were mild and generally inapparent. There were no fatalities.

Immunity Test.—On March 24, 1942, three and one-half months after vaccination, the 10 vaccinated dogs were placed in a pen with 4 unvaccinated dogs and 4 exposure dogs. On the same date, the vaccinated and unvaccinated dogs were also given 1 cc. of 5 per cent natural distemper virus. Results of the test are tabulated herewith.

	NUMBER ON TEST	NUMBER SHOWING SYMPTOMS	NUMBER THAT DIED
Vaccinated dogs	10	0	0
Unvaccinated dogs	4	4	4
Exposure dogs	4	4	4

This group of 10 dogs, which had been vaccinated three and one-half months, received a maximum distemper exposure identical with that described in experiment 247 T (d)-1, and they were subject to the same violent weather conditions in outside pens. Being slightly older than the other group of dogs and not being tested until three and one-half months after vaccination, these dogs exhibited a strong immunity and remained completely well.

EXPERIMENT 206 T (u)-1

Vaccination.—On April 7, 1941, 29 dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 2.5 mg. of

seventy-ninth generation ferret-passage distemper virus (skin-transfer).

Reactions and Mortality.—Reactions were either moderate and prolonged or inapparent. There were no fatalities.

Immunity Test.—On May 13, 1941, five weeks after vaccination, these 29 dogs and 5 unvaccinated dogs were injected with 2.5 mg. of natural distemper virus. There was a temperature reaction in some dogs, but the other symptoms characteristic of distemper were few and mild. Results of the test are tabulated herewith.

	Number on test	Number showing symptoms	Number that died
Vaccinated dogs	29	4	1
Unvaccinated dogs	5	5	3

One vaccinated dog died on June 1, 1941. It could not be determined that the cause of death was distemper, but the fatality seemed to result from the challenge exposure.

EXPERIMENT 247 T(I)

Vaccination.—On April 7, 1941, 11 dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 7.5 mg. of seventy-ninth generation ferret-passage distemper virus (skin-transfer).

Reactions and Mortality.—Reactions were mild and satisfactory and there were no fatalities.

Immunity Test.—On May 13, 1941, five weeks after vaccination, these 11 dogs were inoculated, subcutaneously, with 2.5 mg. of natural distemper virus. The unvaccinated dogs in this experiment were those inoculated in the immunity test in experiment 206 T(u)-1. Very mild symptoms of distemper were noted in 3 of the vaccinated animals and a slight rise in temperature of short duration was observed. One dog died on the nineteenth day without symptoms of distemper. Necropsy and microscopic study of tissues failed to reveal any findings characteristic of distemper.

EXPERIMENT 247 T (a)-1

Vaccination.—On June 19, 1941, 25 dog pups between 8 and 14 weeks old, of various breeds, were injected, subcutaneously, with 10 mg. of seventy-ninth generation ferret-passage distemper virus (skin-transfer).

Reactions and Mortality.—Reactions were mild and not prolonged. There were no fatalities.

Immunity Test.—On July 25, 1941, five weeks after vaccination, these dogs, together with 9 unvaccinated dogs, were divided among 3 pens. At intervals during the next three weeks when they began to show definite symptoms of distemper, 11 exposure dogs were added to the 3 pens to expose the vaccinated and unvaccinated dogs. Results of the test are tabulated herewith.

	Number on test	Number showing symptoms	Number that died
Vaccinated dogs	25	0	0
Unvaccinated dogs	9	7	3
Exposure dogs	11	11	7

The vaccinated dogs in this challenge inoculation withstood the immunity test well after having been vaccinated only five weeks. In contrast to the groups of dogs in the two preceding experiments, 206 T(u)-1 and 247 T(I), which were tested after five weeks by virus injection, this group tested only by contact exposure remained free of symptoms. The exposure was sustained for an especially long period because of the gradual addition of exposure dogs. Mortality was high among the exposure dogs, which were injected, but only moderate among the vaccinated dogs, which obtained their infection from contact. It must be concluded that the unvaccinated dogs were sufficiently immune five weeks after vaccine injection to withstand a much greater exposure to distemper than is usually met by dogs vaccinated in veterinary practice.

SUMMARY OF IMMUNITY IN DOGS

The experimental studies reported in this paper were designed to yield information on immunity produced by ferret-passage virus in relation to generation of ferret passage, dosage of virus, and interval elapsing between the time of vaccination and the immunity test. A summary giving the important features of these experiments and showing the variable factors is presented in table 1.

In an analysis of these results, it is seen that the different methods afford different degrees of exposure, which are of utmost importance in evaluating the immunity produced in the various groups of vaccinated dogs. Contact exposure of 23 unvaccinated control dogs to the virulent test viruses used in these experiments resulted in 8 deaths, or a mortality of 35 per cent, which corresponds closely to the normal mortality from natural distemper in dogs. Of 24 unvaccinated control dogs, exposed to distemper and injected with a virulent virus at the same time, 23 died, giving a mortality of 96 per cent. This double exposure represents a maximum exposure to distemper, and far exceeds any exposure to the disease to which a dog would be subject after vaccination in veterinary practice. Only 5 control dogs were injected with virulent virus without being simultaneously exposed by contact, and 3 of these died. This is an intermediate mortality of 60 per cent, although the number of dogs in this group is too small to give the figure much significance. It is observed, however, that the contact exposure was the mildest; that exposure by subcutaneous injection of virulent virus was more severe; and that exposure by a combination of these two meth-

ods was extremely severe, resulting in a maximum test of immunity far greater than any test by natural exposure. Keeping in mind the degree of exposure, we may examine the experimental results with respect to the other factors involved: the generation of virus used, the dosage of virus injected, and the interval elapsing between the time of vaccination and the immunity test.

IMMUNIZATION AS RELATED TO GENERATION OF VIRUS AND DOSAGE

The immunity studies reveal no differences in the immunizing properties of ferret-passage virus of fifty-seventh, sixty-third and seventy-ninth generations. Vaccines made from virus of the three different generations appear to immunize equally well. This establishes that neither the continued passage of the virus through sixteen generations beyond the sixty-third nor the passage of the virus through ten generations by skin transfer reduces the immunizing property to an appreciable degree. Likewise, it seems that no significant differences in immunity are produced by the several doses used; 2.5 mg. of virus appears to produce as high an immunity as 10 mg. It would seem from the revaccinations reported previously that a dose of virus as small as 2.5 mg. may not always produce a reaction in a dog and that a larger dose may therefore be desirable to establish a "take." In our studies of the pathogenic properties of the ferret-passage virus, we reported that 7.5 mg. of the virus produced milder, shorter, and more well-defined reactions than did 2.5 mg. Thus it becomes apparent that for the immunization of dogs, a dose larger than 2.5 mg. is necessary for consistent immunization and is of distinct advantage so far as vaccination reactions are concerned.

INTERVAL BETWEEN VACCINATION AND IMMUNITY TEST

The interval between vaccination and the immunity test in these experiments varied from five weeks to five months. The experiments were designed to determine how early a protective immunity developed and to explore the degree of immunity by variable degrees of challenge exposure to a virulent virus. It is seen in table 1 that all fatalities occurring upon challenge of the immunity were confined to dogs vaccinated only five or six weeks and that the fatalities occurred only upon injection of the virus, or upon injection and exposure combined, the two more drastic types of test. All vaccinated dogs subjected to exposure alone,

TABLE I—Summary of Challenge Inoculations and Exposures

EXPERIMENT	VACCINATION VIRUS: GENERATION	VACCINATION VIRUS: DOSAGE	INTERVAL BETWEEN VACCINATION AND IMMUNITY TEST	TYPE OF EXPOSURE	VACCINATED DOGS: No. TESTED	VACCINATED DOGS: No. DYING	CONTROL DOGS*: No. TESTED	CONTROL DOGS*: No. DYING
Interval shorter than 7 weeks between vaccination and immunity test								
247 T(a)-1	79	10.0 mg.	5 weeks	exposure	25	0	20	10
247 T(b)-1	63	2.5 mg.	6 weeks	exposure	23	0	20	5
206 T(u)-1	79	2.5 mg.	5 weeks	injection	29	1	5	3
247 T(I)	79	7.5 mg.	5 weeks	injection	11	1	†	†
247 T(d)-1	63	7.5 mg.	6 weeks	exposure and injection	28	4	25	23
				Totals	116	6 (5%)	70	41 (59%)
Interval longer than 7 weeks between vaccination and immunity test								
247 T-1	57	5.0 mg.	2 months	exposure	10	0	7	4
265 T-1	63	10.0 mg.	3½ months	exposure and injection	10	0	8	8
247 T(c)-1	63	2.5 mg.	5 months	exposure and injection	32	0	13	12
				Totals	52	0 (0%)	28	24 (86%)
				Grand Totals	168	6 (3.6%)	98	65 (65%)

*Control dogs include exposure dogs injected with virulent virus and unvaccinated dogs exposed to them.
†Same controls used as on experiment 206 T(u)-1.

either early or late, survived the challenge to their immunity. Moreover, all dogs vaccinated two months or longer were solidly immune to the most drastic exposure, that of direct exposure and injection combined.

NATURE OF FATALITIES FOLLOWING CHALLENGE EXPOSURE

All fatalities occurring in these immunity tests were among the dogs subjected to a challenge exposure five or six weeks after vaccination, and only among dogs tested by the more intensive methods of inoculation, consisting of the subcutaneous inoculation of virulent virus, or of the same inoculation combined with simultaneous exposure to dogs already showing symptoms of distemper. The latter drastic method of challenge was enhanced by the presence in the pen of unvaccinated dogs which, upon contracting the disease, were an added source of exposure. Forty dogs included in experiments 206 T (u)-1 and 247 T (I) were tested five weeks after vaccination by the subcutaneous injection of virulent virus, with two fatalities, one in each experimental group. Five unvaccinated dogs served as controls for these two experiments, which were carried out simultaneously with different doses of virus. All five control dogs showed definite symptoms of distemper and three died, demonstrating the virulence of the virus used for challenge inoculation. That the forty vaccinated dogs were not sufficiently immune at five weeks to withstand an actual injection of virulent virus without reinfection was shown as clearly by the surviving dogs as by the two that died in the course of the test. Daily temperatures were taken on all 40 dogs for thirty days following the challenge inoculation. A few dogs in each group had an abnormal rise of temperature and some slight symptoms of distemper.

The limitation of early immunity was even more apparent in the case of 28 dogs on experiment 247 T (d)-1, which were injected with virulent virus six weeks after vaccination and exposed, together with unvaccinated dogs, to exposure dogs with typical symptoms of distemper. Four deaths occurred in this group of 28. Identification of distemper inclusion bodies in 3 of the 4 dogs established without question that the deaths were due to the distemper virus. These fatalities were accompanied by excessive losses in the control dogs; 23 of the 25 exposure and unvaccinated dogs died. It is not clear that the fatalities among the vaccinated dogs and the mortality rate in the group of controls were due entirely to the drastic methods of exposure and the virulence of the strain of distemper used. For a while all of the dogs were inadvertently exposed to violent spring storms and this exposure to the weather may have been a factor in the high mortality.

IMMUNITY TO NATURAL DISTEMPER

It appears certain that none of the fatalities described previously would have occurred under conditions of contact exposure to distemper, since there were no fatalities in the 58 vaccinated dogs tested by that method. The twenty-five dogs on experiment 247 T (a)-1 and the 23 dogs on experiment 247 T (b)-1, which had been vaccinated for periods of five and six weeks, respectively, and the 10 dogs on experiment 247 T-1, which had been vaccinated two months, demonstrated a complete protective immunity upon exposure. Moreover, in the group of 20 unvaccinated dogs also exposed, 6 died and all showed symptoms of distemper to a greater or lesser degree. It would thus seem established that even at five or six weeks after vaccination, sufficient immunity had developed, following injection of the ferret-passage virus, to protect the dogs against direct exposure to the disease. Forty-two dogs on experiments 265 T-1 and 247 T(c)-1, which were given maximum exposure after three and a half and five months, respectively, were solidly immune. Not only were there no fatalities, but no symptoms of a mild reinfection were present upon exposure. The 10 dogs on the last experiment were inadvertently exposed to violent weather conditions during the course of the immunity test but manifested no breakdown in their immunity.

SUMMARY AND CONCLUSIONS

Foxes and dogs inoculated with ferret-passage distemper virus become immune to natural dog distemper. Although foxes show no visible reactions, these animals rapidly develop a degree of immunity sufficient to protect them upon exposure to a

virulent epizoötic distemper. Dogs vaccinated with the ferret-passage virus commonly show visible, mild reactions, but become immune to distemper even though they show no reaction. At five and six weeks after vaccination, their immunity is sufficient to withstand a challenge contact exposure to the virulent disease. At that time, the immunity can be broken through in an occasional dog by combined contact exposure and subcutaneous injection of a highly virulent distemper virus. At three and a half and five months after vaccination, a degree of immunity has been developed that cannot be broken down by maximum exposure. A dosage of vaccine virus as low as 2.5 mg. may be subinfective and fail to immunize. Dosages of 7.5 mg. and 10 mg. immunize consistently and produce generally shorter and milder reactions than a smaller dosage. Ferret viruses of 57, 63, and 79 serial passages appear to immunize dogs equally well.

References

[1]Carré, E.: Sur la Maladie des jeunes Chiens. Compt. rend. Acad. d. Sci., *140*, (1905): 689. Sur la Maladie des Chiens. Compt. rend. Acad. d. sci., *140*, (1905): 1489.

[2]Kregenow, C.: Ueber die Filtration des Staupecontagiums. Centralbl. f. Bakt. Abt. I, Orig., *50*, (1909): 326.

[3]Lignières, J.: Sur la Maladie des Chiens et le Virus filtrant de Carré. Bull. Soc. Centrale Med. Vet., *83*, (1906): 622.

[4]Ferry, N. S.: *Bacillus bronchisepticus* (bronchicanis) the Cause of Distemper in Dogs and a Similar Disease in Other Animals. Vet. J., *68*, (1912): 376. Further Studies on the *Bacillus bronchicanis*, the Cause of Canine Distemper. Am. Vet. Rev., *41*, (1912-1913): 77.

[5]Torrey, J. C., and Rahe, A. H.: Studies in Canine Distemper. J. Med. Res., *27*, (1913): 291.

[6]Puntoni, V.: Saggio di Vaccinazione Anticimurrosa Preventiva eseguita per mezzo del virus specifico. An. d'Ig., *33*, (1923): 553. Ancora sulla Vaccinazione Anticimurrosa per mezzo del virus specifico. An. d'Ig., *34*, (1924): 406.

[7]Laidlaw, P. P., and Dunkin, G. W.: A Report upon the Cause and Prevention of Dog Distemper. Vet. J., *84*, (1928): 596.

[8]Lebailly, C.: Vaccination préventive et specifique des Chiens contre la Maladie du jeune Age. Compt. rend. Acad. d. sci., *185*, (1927): 370.

[9]Green, R. G.: Distemper in the Silver Fox (*Vulpes vulpes*). Proc. Soc. Exper. Biol. and Med., *23*, (1926): 677.

[10]Green, R. G., Ziegler, N. R., Halvorson, H. O., Green, B. B., and Dewey, E. T.: Epidemic Encephalitis in Foxes. J. Bact., *15*, (1928): 47.

[11]DeMonbreun, W. A.: The Histopathology of Natural and Experimental Canine Distemper. Am. J. Path., *13*, (1937): 187.

[12]Green, R. G., and Evans, C. A.: A Deficiency Disease of Foxes. Science, *92*, (1940): 154.

[13]Green, Robert G.: Zoölogic and Histologic Modification of the Distemper Virus by Ferret Passage. Am. J. Hyg., 41, (1945): 7.

[14]Green, R. G., and Swale, F. S.: Vaccination of Dogs with Modified Distemper Virus. J.A.V.M.A., *95*, (1939): 469.

[15]Green, R. G., Carlson, W. E., and Swale, F. S.: Vaccination of Dogs with a Modified Distemper Virus. Vet. Med., *35*, (1940): 302.

[16]Stader, Otto, and Slaughenhaupt, R. R.: Distemperoid Virus as an Immunizing Agent Against Canine Distemper. North Am. Vet., *23*, (1942): 782.

[17]Editorial: Poliomyelitis Inhibition. J.A.M.A., *121*, (1943): 194.

[18]Schlotthauer, Carl F.: Green's Modified Canine Distemper Virus Vaccine: A Clinical Study of Its Efficacy. J.A.V.M.A., *103*, (1943): 290.

The Journal's Circulation

As the JOURNAL went into its 107th volume with the July issue, its subscription list climbed to nearly 10,000—a figure far beyond the circulation any journal of veterinary medicine has heretofore attained. All credit for the constantly increasing influence of your *J.A.V.M.A.* stems from the devotion of the individual veterinarian to his profession. Without that, the substantial progress could not have been achieved.

—U. S. Army Medical Dept.

Chief veterinarians of the three governmental services in the Pacific confer at the annual meeting of the Hawaii Territorial Veterinary Medical Association. They are (left to right)—Dr. E. H. Willers, territorial veterinarian; Col. Wayne O. Kester, V.C., chief veterinarian, U. S. Army Forces, Pacific Ocean Area; and Dr. A. A. Julien, inspector in charge, U.S.D.A., Bureau of Animal Industry, Hawaii.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Observations on the Use of Diethylstilbestrol in Rabbit Breeding

L. R. HUTSON, B.V.Sc., D.V.Sc.
Leeward Islands, B.W.I.

A REVIEW of recent literature on the value of this synthetic estrogen in animal hormonal therapy discloses that successful results have followed its use on both large and small animals: horses, cattle, swine, sheep, and dogs. The purpose of this paper is to record observations on its use in rabbits.

Within the last few years there has been a considerable expansion in the raising of rabbits for food purposes by householders on the island of Antigua, B.W.I., and other islands of the Caribbean area. Often these breeders complain of considerable difficulty and sometimes complete failure in being able to get purebreds of the larger breeds to mate, whereas, little or no trouble is experienced in the mating of the common or garden type of rabbit. Such disappointment is discouraging among breeders and often prompts them to dispose of the larger breeds and revert to breeding ordinary native rabbits; this is unfortunate, inasmuch as there is a marked difference in the carcass weights. Furthermore, size in rabbits is a breed characteristic and cannot be produced by feeding large quantities of food to naturally small animals. In view of the possible value of diethylstilbestrol in correcting the breeding disorder already outlined, it was decided to carry out trials in representative cases.

This preparation is a new standardized synthetic estrogen which exerts an action similar to the natural female estrogenic hormones. Its use in veterinary medicine may be summarized as follows:

1) To regulate estrual periods or restore them if the disorder is due to hormone dysfunction.

2) To restore sexual drive and receptivity in female animals.

It is generally agreed that while the use of this preparation will usually induce estrus without concurrent ovulation, that with the restoration of the normal estrual cycle, ovulation will usually occur in subsequent periods. This preparation, therefore, appears to be suitable for use in the rabbit by reason of the facts that:

a) There is no regular estrual cycle in the rabbit as occurs in other animals such as the mare, cow, ewe, sow, and bitch, but there is evidence that there are certain periods of greater receptivity. In fact, some authorities go so far as to say that if nutritional conditions are favorable, the does are not moulting, and are in proper breeding condition, they may be mated at any time, if restrained. With this latter finding I do not agree.

b) Ovulation in the rabbit occurs eight to ten hours following coitus. Hammond[1] has shown the success of matings in relation to the time of ovulation and the value of a second mating five hours after the first so as to approximate the time of such ovulation.

Trials were carried out principally with virgin does and to a lesser extent in previously mated ones, using diethylstilbestrol standardized to 2 mg. per cc. The following are the case reports:

Report 1.—The subjects were two virgin Flemish Giant does, 10 months old.

History.—They had consistently refused service over a three-week trial period.

Treatment.—Each doe received an intramuscular injection of 0.5 cc. of diethylstilbestrol.

Results.—Both does were tried in twenty-four hours after the injection when

The author is chief veterinary officer, Department of Agriculture, Antigua, Leeward Islands.

they readily accepted the buck. Two matings were allowed at an interval of five hours. Litters of 7 and 8 rabbits, respectively, were dropped and successfully raised.

Similar difficulty was experienced in getting these same does to mate following a recovery period of three weeks after weaning their litters at 8 weeks of age. Accordingly, the same procedure as outlined above was repeated with resultant litters of 8 rabbits each. Following this, both does continued to breed normally.

Report 2.—The subject was a previously mated Flemish Giant x Belgian Hare doe, 1 year old.

History.— Following the successful raising and weaning of her first litter of 9 rabbits, this doe consistently refused to accept the buck over a four-week trial period following weaning.

Treatment.—One half cc. of diethylstilbestrol was injected intramuscularly.

Results.—The doe was successfully mated in twenty-four hours, two matings being allowed at a five-hour interval. A litter of 7 rabbits resulted and they were raised successfully. Following this, the doe continued to breed normally.

Report 3.— The subject was a virgin Flemish Giant doe, 11 months old.

History.— The owner of this animal stated that all attempts at mating over a period of six weeks had been unsuccessful with consistent refusal by the doe.

Treatment.—One half cc. of diethylstilbestrol injected intramuscularly.

Results.— Successful mating within twenty-four hours. two matings allowed as before. This doe dropped a litter of 5 rabbits of which 4 were successfully raised. No follow up on subsequent breedings was possible.

SUMMARY

1) This report records observations on the use of diethylstilbestrol in an effort to stimulate sexual receptivity in doe rabbits otherwise unwilling to accept service.

2) A number of selected cases both in virgin and previously mated does are presented where successful results were obtained.

3) The opinions are expressed (*a*) that this preparation is of value in correcting breeding dysfunction in this class of female animal as exhibited by a lack of sexual receptivity; (*b*) that it is suitable for use in rabbits where no definite estrual cycle exists, and ovulation follows as a sequel to coitus.

Reference

[1]Hammond, John: The Fertilisation of Rabbit Ova in Relation to Time. A Method of Controlling the Litter Size, the Duration of Pregnancy, the Weight of the Young at Birth. J. Exptl. Biol., 2, (1934): 140-161.

Teat Amputation

Dr. S. D. Johnson (*Cornell Vet.*, April, 1945) recommends the following operation for teat amputations in acute mastitis or to destroy hopelessly damaged quarters. Inject 20 cc. of 2 per cent novocain around the base of the teat, apply the emasculatome (Burdizzo) about the middle of the teat, and remove the lower half with a sharp scalpel.

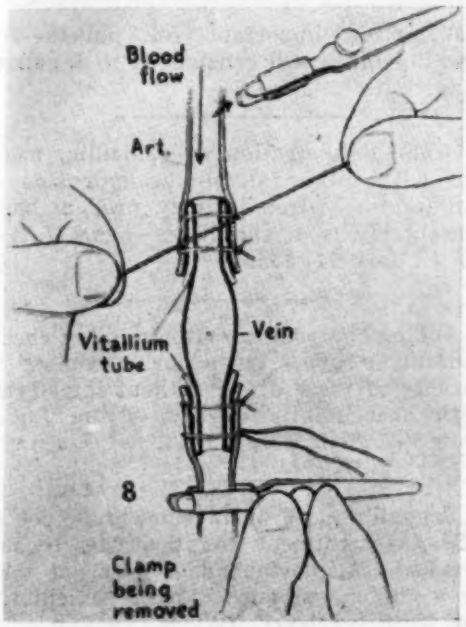
Washing Out Esophageal Obstruction in Horses

In washing out a choke in horses with pump and tube, there is always some danger of flushing some of the backwash into the lower air passages. Swallowing with a tube crossing the pharynx is considerably hampered. A way of overcoming that danger is to pull the horse's head toward the floor, so that the backwash will flow out of the nostrils by gravity. A strong ring, through which to pass the halter shank, is fastened to the floor at the right spot for the purpose. The horse objects but if backed into a stall so that he cannot pull backward, the job can be done quickly. Moreover, since chokes in old horses may be, in fact often are, due to esophageal dilatation (jabot), there is danger of rupturing the esophageal wall and dumping the whole mass into the mediastinum in playing fast and loose with pump and tube in choked horses. It will be recalled that Blattenberg prevented reflux by making an incision in the neck and running a tape around the tubed esophagus, and then pumped and syphoned with great gentleness.

Pullets do equally well on pelleted and unpelleted feed, says *Poultry Science*.

Anastomosis of Blood Vessels

There is probably little occasion for anastomosing blood vessels in routine animal surgery. But inasmuch as such work is commonly done experimentally on animals in the study of surgery, feasibility is not a question, and indoctrination of the technique, if indications are rare, is at least academic. Speaking admittedly without experience, the occasion to anastomose large arteries may not be so rare as to be ruled out entirely in the treatment of injured animals. Since World War I, and particularly among the casualties of the present war, surgeons write of the anastomosis of blood vessels as if it were a daily practice. In fact, the need of anastomoses is emphasized. There are many designs of injuries from high explosive missiles, land mines, and rocket shells where the continuity of blood vessels, main and collateral, was destroyed beyond hope that circulation would be spontaneously reëstablished, and the survival of the injured limb depended upon immediate repair of its irrigation. Precious war dogs are exposed to this type of injury, and the violence of automobile accidents may perhaps furnish an occasional indication for such operations in civilian practice.



—From Annals of Surgery

Metallic cannula used to reconnect injured blood vessels with the main or collateral ones.

The details cannot be described here because space-consuming and obviously out of place for the general reader. Suffice to say that injured blood vessels are successfully reconnected with the main or collateral ones by means of a metallic cannula ingeniously fitted on the inside with a vein graft to prevent coagulation on the metallic surface. For the cannula, vitallium, an alloy of cobalt, chromium, and molybdenum, is used because of its nonirritating qualities.

The technique of a nonsuture method of bridging blood vessels is described, with illustrations, in the April issue of *Annals of Surgery* by Blackmore and Lord, Columbia and Cornell surgeons. As the success attained by these authors on the femoral circulation was 85 per cent in contaminated wounds of dogs when the nonsuture method was used, feasibility is not a deterrent to the bridging of blood vessels in veterinary practice. The occasional resort to vessel bridging in internal injury and disease, as well as in orthopedic surgery, is a more remote prospect in our field.

Drying Off Diseased Quarters

It is sometimes advisable to destroy the secretory tissue in a quarter that becomes badly diseased and fails to respond to the usual treatments. To do this, dissolve 3 Gm. silver nitrate crystals in 100 cc. distilled water; inject this solution through the teat canal into the quarter at the rate of 30 cc. for a small quarter on a small cow and graduate according to size so that a large quarter on a large cow will receive 60 cc. Leave the solution in the quarter, which will swell, unless the cow is off feed for more than two feeding periods. Some quarters are totally dry after two weeks, but most of them will need about two months. Quite often a second or even a third injection will be necessary.—*From Cornell Veterinarian, April,* 1945.

Fracture Fixation with Nails

Treatment of certain types of fractures by the use of a V2A steel nail in the medullary cavity is reported from The Netherlands. Proper use requires a complete set of instruments, a large collection of nails, an excellent x-ray equipment, reduction frames, and an extensive experience.—*J. Am. M. A., July* 14, 1945.

CLINICAL DATA

Clinical Notes

Both penicillin and sulfadiazine are highly effective drugs in the treatment of human actinomycosis.—*Dobson and Cutting in J. Am. M. A., July 21, 1945.*

Avian leucosis virus may be attenuated with crystal violet to produce a vaccine which gives encouraging results, says E. P. Johnson in the *American Journal of Veterinary Research* (July, 1945).

Dengue vaccine, which protected volunteers against this painful and debilitating disease, was produced by passing the virus through mice.—*Science News Letter, June 30, 1945.*

Tularemia has been successfully treated in 61 cases reported by Dr. W. W. Jackson in the *American Journal of Medical Sciences.* He uses a 2 per cent solution of bismuth sodium tartrate buffered with sucrose to make it isotonic for intravenous injection.

Adrenalin may help to prolong the action of penicillin when injected subcutaneously, according to a report by Fisk, Foord, and Alles in *Science.* Adrenalin concentrations of 1 to 50,000 up to 1 to 1 million are compatible with penicillin, and the blood level of penicillin is maintained for a longer time.

Sulfaquinoxaline protects against experimental infection with *Pasteurella avicida,* says Delaplane, because only 6 of 93 birds showed mild symptoms when they were infected after feeding of the drug had started. It has no recognizable curative properties when fed after symptoms appear.—*From Am. J. Vet Res., July, 1945.*

Water is important for pullets—100 growing birds will consume 4 to 5 gallons daily.

Oral administration of penicillin, modified with either aluminum hydroxide or magnesium hydroxide, may prolong blood concentrations of the drug.—*From J. Am. M. A., July 21, 1945.*

Adding charcoal to santonin, oil of chenopodium, or carbon tetrachloride reduces the toxicity of these drugs without interfering with anthelmintic efficacy.—*From Indian J. of Vet. Sci., March, 1944.*

Penicillin used intravenously is not an effective treatment for mastitis, because the lactating bovine udder does not serve as a major systemic exit for penicillin in the blood.—*Science, July 13, 1945.*

Paraäminobenzoic acid (Paba) exerts a considerable effect in suppressing spotted fever as well as typhus. It does not kill the virus, but prevents its growth. Paba also counteracts the effects of the sulfa drugs.

Foot rot in cattle may be effectively treated, says Dr. L. A. Tischhauser, in *North American Veterinarian,* by cleaning the foot, applying a quick-drying pyoktanin blue solution, and then using a solution composed of 75 cc. of phenol, 150 cc. of formalin, and water to make 500 cc. By covering the affected tissue between the claws with a narrow strip of cotton long enough to extend about 3 inches above the foot, front and rear, holding this cotton in place with a rubber band under the dewclaws, and then soaking with the above solution, good contact is maintained. The treatment may be repeated morning and evening.

DDT Has Possibilities of Becoming A Remedy for Sheep Ticks

N. G. COBBETT, D.V.M., and C. E. SMITH, D.V.M.
Las Vegas, N. Mex. *Colorado Springs, Colo.*

THE FAVORABLE record of DDT (dichlorodiphenyl-trichlorethane) as an insecticide for lice, flies, and other pests, and the knowledge that adequate supplies of the material will, no doubt, become available after the war, prompted efforts to ascertain its effectiveness and practicability as the toxic agent in dips for the destruction of the so-called sheep tick, or ked, *Melophagus ovinus*. Some dipping experiments were, therefore, conducted at the Zoölogical Division field stations at Colorado Springs, Colo., and Las Vegas, N. Mex., during July and August, 1944. In view of the preliminary nature of the experiments, relatively small numbers of sheep and comparatively small dipping vats were utilized. Dipping was conducted in the usual manner, the sheep being restrained in the solution only long enough to insure thorough wetting.

RECORDS OF TESTS

In Colorado, a moderately infested farm flock of 408 sheep, consisting of shorn ewes and rams, and unshorn spring lambs, was selected for the test. The flock was separated into 3 equal lots and the animals in each lot were marked for identification. Lot 1 was dipped in a 0.25 per cent suspension of DDT, lot 2 in a 0.5 per cent suspension, and lot 3 in a 1.0 per cent suspension.

In New Mexico, a moderately infested flock of 75 unshorn spring lambs was dipped. The flock was separated into 3 equal lots and each lot was marked for identification. Lot 1 was dipped in a 0.1 per cent suspension of DDT, lot 2 in a 0.25 per cent suspension, and lot 3 in a 0.5 per cent suspension.

Postdipping examinations were made of a number of animals, selected at random from each lot in each flock, on the twenty-fourth hour and seventh days following dipping. Further examinations were made at weekly intervals for a period of sixty days in New Mexico and at monthly intervals for a ninety-day period in Colorado.

From the Zoölogical Division, Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture.

Many dead ticks were found on the sheep throughout the post-dipping examinations. Only 1 living tick, a very inactive, newly emerged parasite, was found during the initial postdipping examinations and none was observed a week later. On the fourteenth day following dipping, newly-emerged live ticks were found on lambs in each lot of the New Mexico flock. Thereafter, no living ticks were found on any of the sheep in either flock.

It is apparent from these observations that young ticks continued to emerge from viable tick pupae remaining in the fleece of the sheep for a postdipping period of at least fourteen days. However, all of these apparently succumbed to the DDT that remained in the wool of the dipped sheep, resulting in the ultimate eradication of the sheep-tick infestation in all lots of sheep involved in the tests.

DISCUSSION

The DDT settled rather rapidly in the water when dipping was interrupted momentarily, and it did not break down into particles of sufficient fineness to produce a uniform suspension in water. If large flocks of sheep were being dipped, therefore, the latter factor might result in most of the DDT being carried out by the animals early in the process of dipping, thus producing an early reduction in the potency of the dip. As a consequence, attempts were made to obtain the desired effect with the aid of suspending and dispersing agents. The powder was mixed with an equal amount, by weight, of either methyl alcohol or a commercial sulfonated soybean-oil emulsifier before it was added to unheated water in the dipping vats. Neither agent produced the desired suspension or dispersion of the DDT, and it was later observed that the sulfonated soybean-oil emulsifier caused an objectionable matting of the wool on the dipped sheep.

SUMMARY AND CONCLUSIONS

Six lots of tick-infested sheep were dipped in unheated aqueous baths containing DDT in concentrations of from 0.1 to

1.0 per cent. The results in these preliminary field experiments indicate that DDT, in aqueous suspensions of as little as 0.1 per cent, may compare favorably with rotenone-bearing products for the control of the sheep tick. Moreover, the dipping of sheep in aqueous suspensions of DDT containing as much as 1 per cent of the insecticide resulted in no apparent injury to the animals.

Only the agitation of the dip, caused by swimming sheep, prevented the insecticide from rapidly settling to the bottom. The practicability of incorporating DDT in sheep dips, therefore, will depend largely upon finding a suitable solvent or satisfactory suspending and dispersing agents for the insecticide. Neither methyl alcohol nor a commercial sulfonated soybean-oil emulsifier was satisfactory for this purpose, and the latter caused an undesirable matting of the wool on dipped sheep.

Isolation of Trichomonas Foetus

A method of "Isolation of *Trichomonas Foetus* (Riedmüller, 1928) in Bacteria-Free Culture by Use of Penicillin" is reported by A. H. Mahmoud in *Annals of Tropical Medicine and Parasitology.*

A small amount of vaginal discharge is collected under conditions as nearly aseptic as possible, well shaken with 2 cc. of sterile normal saline solution in a test tube, and then inoculated into culture tubes in which each cubic centimeter of medium contains 30 Oxford units of penicillin. These tubes are incubated at 37 C. and maximum growth is reached in six days, while the penicillin inhibits the growth of contaminating bacteria.—*From Abstract in The Veterinary Journal, May, 1945.*

Methylcellulose—Hydrophilic Laxative

Compared with mineral oils, which interfere with the absorption of fat-soluble vitamins and degrade intestinal enzymes, the hydrolytic gums have been laxatives of choice in small animal medicine. Agar, tragacanth, acacia, and others superseded the vegetable oils which, being partly absorbed, do not extend their action throughout the intestinal tract. The mucilaginous galenicals have the advantage of being so slightly metabolized that their through and through laxative action is uniform and they have but little effect on intestinal bacteria and enzymes. Recently, several synthetic mucilages without objectionable properties have been developed. Among them are polyvinyl alcohol and methylcellulose (*J. Am.M.A.*, April 14, 1945), which are nontoxic, hydrophilic colloids, sharing with other gums advantages over the mineral oils. That is, they do not disturb fat-soluble vitamins, bacteria, or enzymes, and act throughout the entire length of the bowels.

Foot-and-Mouth Disease Vaccination

Major Rowland W. Rushmore, V.C., U. S. Army (*Bull. U. S. Army, M. Dept.*, June, 1945) reports a high incidence of foot-and-mouth disease in Italy during the American invasion and the steps taken to control it in the face of the food shortage among the civilian population. When Rome had been liberated, a veterinary laboratory was rehabilitated in that city for the sole purpose of producing a modified type of Waldmann's foot-and-mouth disease vaccine. The cattle required had to be brought to the abattoir from a distance of a hundred miles. The meat of the cattle was salvaged for food after harvesting the vaccine; no harmful results were observed among the consumers. By late 1944, the laboratory had produced 36,000 doses of vaccine for adult cattle (50 cc.) and, fortunately, not a single case of the disease occurred among the vaccinated animals. Between September 15 and October 15, 15,000 dairy cows and calves were vaccinated in the Province of Rome, and the only outbreak seen was among 280 unvaccinated cattle. Immunity developed in fifteen days, though there was evidence that some treated animals were protected within a week. The doses were: for adult cattle, 50 cc.; calves up to 600 lb., 20 to 35 cc.; and swine 5 to 15 cc. The injections were made in the dewlap of cattle and in the flank of swine.

The significance of this report is the outstanding results obtained. In Rome Province, four months after vaccination was started, outbreaks occurred only in nonvaccinated herds.

The methods employed at the Rome laboratory in the preparation of the vaccine are described in detail, including the variations from the original Waldmann technique described at the International Veterinary Congress of 1938. The author is

convinced that the tremendous economic losses from foot-and-mouth disease can be greatly reduced by vaccination with this or a similar vaccine. Those interested in the technique of preparation will consult the original article.

Treatment of Laryngotracheitis

The prominent symptoms of this condition are gasping, coughing, wheezing cawing, or gurgling respiratory sounds. The bird may sit with the head elevated and the beak wide open. The author (A. H. Quin, *Vet. J.*, May, 1945) suggests that veterinary practitioners can render poultry owners a most profitable service by making a proper differential diagnosis and then using preventive vaccination. Such a diagnosis often requires laboratory confirmation, since it must rule out infectious bronchitis, coryza, pneumoencephalitis, vitamin A deficiency, and fowl pox.

The use of vaccine is indicated to prevent spread from pen to pen on an infected farm, to protect young birds on a farm where survivors of an outbreak remain, to protect additions to a flock that has been infected or vaccinated, and to safe guard a flock in a congested poultry area where the dicease is prevalent.

Vaccination is contraindictated in flocks where there is an outbreak of respiratory disease not definitely diagnosed as laryngotracheitis, in unexposed clean flocks, and in the hands of attendants unfamiliar with the use of live virus vaccine.

Methylene Blue Test in Infectious Hepatitis

A test has been devised which is of value in determining the presence of biliary pigments in the urine in preicteric stages of infectious (epidemic) hepatitis in man, and is described by Captain S. S. Gellis, M. C. and J. Stokes, Jr., M. D.—(*J. Am. M. A., July 14, 1945.*)

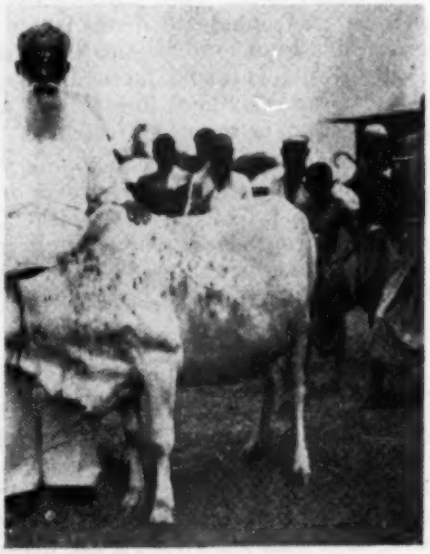
It has been suggested that possibly this test might help in differentiating some of the cases of acetonemia, milk fever, and albuminuria in cows. If so, it would give a clue as to which cases were complicated with liver damage, and it might point the way for more logical treatment of cases.

The methylene blue test is performed as follows: To 5 cc. of prebreakfast urine add 2 drops of a 0.2 per cent aqueous solution of methylene blue chloride (pipettes calibrated to deliver 20 drops per cc.). If a green color results, add solution drop by drop until a blue color appears. If more than 5 drops are used, icterus is likely to appear within a few days.

The exact mechanism of the test is uncertain, but it would seem that a study of its use on cows is indicated.

Cutaneous Rinderpest

India and some other eastern countries report a cutaneous form of rinderpest, called pox. It is a common condition in some outbreaks (30% of cases), but is less prominent in most areas (5 to 10% of cases). The cutaneous nodules burst and form a matted scab, both the exudate and the scab being capable, on inoculation, of causing primary as well as skin lesions of rinderpest. The condition is fully described by A. D. MacGregor in the *Indian Journal of Veterinary Science* (March, 1944).



—From Indian Journal of Veterinary Science

A case of cutaneous rinderpest in India.

Active immunity to *Pasteurella tularensis* was produced in white rats by the use of vaccines prepared from yolk sacs of infected chicken embryos.—*C. L. Larson, Public Health Reports, June 6, 1945.*

Bovine Infectious Keratitis

Pinkeye is the common name for this disease which is known to all veterinarians and dairymen because of the acute inflammation of the eyeball and its surrounding tissues, which may affect cattle of all ages and breeds. Economic importance of the condition is high, although actual death losses are low.

Baldwin studied swabs from 112 infected eyes and found that 93 (83%) of them yielded *Hemophilus bovis*. Using his cultures, he successfully infected 12 of 15 experimental animals by instilling the organism into the eye. He failed to find *H. bovis* in either eye of 20 normal cattle. Although he was unable to demonstrate the presence of systemic antibodies in infected or in recovered animals, there did appear to be a definite resistance to infection when recovered animals were reinfected.

It was not possible to produce pinkeye in sheep, using the cultures of *H. bovis* or the secretion from infected eyes. Neither was it possible to reproduce the disease in mice, guinea pigs, and rabbits.—*From Am. J. Vet. Res., July, 1945.*

Barium Chloride for Indigestion

Barium chloride has a stimulating effect on all types of muscle, and produces its action independently of nervous control. Auchterlonie, reporting in the *Veterinary Record*, says that when 7.5 gr. are dissolved in 20 to 25 cc. of distilled water and are injected slowly into the jugular vein of the horse, there results a thorough unloading of the intestine, without pain. When used in subacute impaction and in ordinary spasmodic colic, he has observed no untoward results. He believes that the frequent fatalities which have been recorded are the result of excessive dosage.

This intravenous injection should always be accompanied by use of the phonendoscope to reveal the degree and nature of intestinal action, and it may be repeated in one or two hours if the response is not sufficiently great.

Favorable effects are also reported following the use of barium chloride, intravenously, in tympany and overloading in cattle. Auchterlonie believes that the dosage tolerated is somewhat greater in the cow, and that the 7.5-gr. dose may be repeated with safety several times at intervals of an hour or two.

Although it must be used judiciously, no other drug produces quite the same result in quite the same way.

Penicillin Therapy in Mastitis

When 20,000 units of penicillin (sodium salt) dissolved in boiled distilled water were injected into mastitis-infected quarters during each of five successive milking intervals, all of the treated quarters were freed of their infection, according to work reported in the *Cornell Veterinarian* by Murphy and Pfau.

They concluded that penicillin sodium dissolved in boiled distilled water (30 to 250 cc.) is only slightly toxic for the mammary gland; that there is a macroscopic improvement in the appearance of the milk from certain glands in a very short time; and that period of lactation, duration of infection, degree of induration of the quarter, degree of macroscopic abnormality of the secretion, or previous treatment fails to influence the results of the treatment in the dosage mentioned. Smaller amounts of penicillin and single injections of even larger amounts produced results that were less satisfactory.

Zinc Phosphide Poisoning in Poultry

Zinc phosphide, which has achieved considerable popularity as a destroyer of vermin, is correspondingly common as a source of accidental poisoning of poultry.

Symptoms are not well marked; in fact, under experimental conditions birds die in from three to eighteen hours, showing only a terminal coma. Blaxland and Gordon, of Weybridge, Eng., believe that the degree of coma and the time elapsing before death depend somewhat on how much feed the crop contains at the time the poison is ingested.

Postmortem findings are characterized by the unpleasant, pungent odor of phosphine, a gas liberated from the zinc phosphide by the action of the digestive juices. There is evidence of cardiac collapse. The flesh and the visceral organs have a greasy, dirty appearance. The liver and kidneys

are dark in color and markedly congested. The lungs are somewhat edematous.

Zinc phosphide may be used as a paste or as a "sausage," but in either form is highly toxic for poultry. As little as 1 gr. is enough to kill a 5-lb. bird.—*From Veterinary Journal, May, 1945.*

Bovine Mastitis Caused by a Corynebacterium

A Corynebacterium which has not been previously described is reported by Palmer, Kakavas, and Biddle in the *North American Veterinarian.* It produced a type of mastitis which the herdsman was able to recognize before the bacteria could be demonstrated in the milk, because he noticed a fullness of the quarter when milked out. Milk changes were not marked; a few flakes in the first streams, slight increase in chlorine, large increase in catalase reading, little or no change in pH.

Sulfanilamide-in-oil appeared to have some value when injected into the quarter, but was not effective in most cases. When the cow was kept on feed (grain) and milked regularly, the swelling remained and was still present in the next lactation period. When grain was removed from the ration and the cow milked only once every few days to relieve the udder tension, the quarter began to show some improvement in six or eight weeks.

Mechanism of Muscular Contraction

The Hungarian Society for Natural Sciences heard Prof. A. de Szent-Gyorgyi report on a research project which explains how living muscles contract. In attempting to extract myosin from muscle tissue, he failed to get the expected reaction but, upon studying the resultant product, he found something entirely different. Myosin occurs in rod-shaped cylinders which tend to arrange themselves side by side. What de Szent-Gyorgyi saw was a filament consisting of globular particles arranged in a string like beads. This proved to be a protein not previously reported, and which he called actin. When brought in contact with the myosin cylinders, the actin globules adhere to the ends and form a spiral. This, it was found, produces the cross-striation of voluntary muscle.

When a potassium salt is added to the myosin-actin blend the myosin precipitates and contracts or shrinks. This shrinkage bends the actin string, and the result is seen as muscle contraction. In voluntary

—*From Science News Letter*

Prof. A. de Szent-Gyorgyi

muscle, the myosin system is closely packed, while in smooth muscle it is loosely packed. All of the structures and changes can be studied under the microscope.—*From Science News Letter, July 14, 1945.*

Nitrite Poisoning

Poisoning of cattle and poultry after a rain may be explained on the basis of nitrite content. Hay or dry forage may have considerable quantities of stored nitrates, as well as a reducing substance, capable of converting these to nitrites. When moisture activates the reducing agent, nitrites are formed at a rate which produces maximum toxicity in eighteen to twenty-two hours. Nitrite is toxic at 1/10 to 1/20 the dose of nitrate. A turkey not visibly affected by 50 gr. of nitrate died on 7 gr. of nitrite.—*From Am. J. Vet. Res., July, 1945.*

Cancer of the kidneys may be diagnosed by finding cells that have been shed from the neoplasm. The method is easy, rapid, and economical.

Anaplasmosis in Kansas

In the treatment of anaplasmosis, sodium cacodylate was evaluated from "sheet anchor" down to "no value" in 43 replies to a questionnaire circulated by Secretary Bower of the Kansas Veterinary Medical Association. The conflicting report was based upon 1,620 cases, most of which were in animals over 2 years old. The mortality ranged from 0 to 75 per cent, average 22 per cent. The diagnoses were mostly based upon clinical evidence. Deaths occurred a few minutes to three days after symptoms appeared. Good nursing and early treatment were pronounced important.

Public Health Service Announces Examinations for Appointments for Scientific Officers

Veterinarians who are interested in public health work as a life career should take particular note of the recently announced competitive examinations which will be conducted by the U. S. Public Health Service. These examinations are for appointments in the Regular Corps in grades of assistant grade (1st lieutenant) and senior assistant grade (captain).

Regular Corps appointments are permanent in nature and provide opportunities for qualified scientists for a life career in one or more of the large number of fields allied to public health, including research. Assignments are made with all possible consideration of the officer's demonstrated abilities and experience.

Entrance pay for assistant grade, with dependents, is $3,411 a year; for senior assistant grade, with dependents, $3,991 a year. Promotions are at regular intervals up to and including the grade of medical director (corresponding to a full colonel) at $7,951 a year. All expenses for official travel are paid by the Government; thirty days annual leave, with pay, is provided. Retirement pay provisions are also made. All commissioned officers have full military status for the duration of the war.

The announced examinations will be oral and written. The oral examinations will be held at 9:00 a. m. at the several places listed below and on the dates shown:

Atlanta, Ga., 605 Volunteer Bldg., Sept. 13.
Baltimore, Md., Marine Hospital, October 1.
Boston, Mass., Marine Hospital, September 10.
Chicago, Ill., Marine Hospital, September 25.
Cleveland, Ohio, Marine Hospital, September 27.
Detroit, Mich., Marine Hospital, September 26.
Fort Worth, Texas, U.S.P.H.S. Hospital, September 15.
Kansas City, Mo., 603 B.M.A. Bldg., September 22.
Kirkwood, Mo., Marine Hospital, September 24.
Los Angeles, Calif., 406 Federal Bldg., September 17.
New Orleans, La., 210 State St., September 14.
New York, Staten Island, Marine Hospital, September 11.
Norfolk, Va., Marine Hospital, September 12.
San Francisco, Calif., Marine Hospital, September 18.
Seattle, Wash., Marine Hospital, September 20.
Washington, D. C., USPHS Dispensary, October 2.

Written examinations will be held on October 8, 9, and 10, 1945, at places convenient to the candidates and the Service.

An applicant for assistant grade must be a citizen of the United States, must present a diploma of graduation from an institution of recognized standing, must have had at least seven years of education (exclusive of high school) and professional training or experience (*e. g.*, for a veterinary applicant, five years of veterinary education, including preveterinary training, and two years of practice or experience in other work such as meat inspection, field work, etc.), and must pass a physical examination by a medical officer of the Public Health Service.

An applicant for the senior assistant grade must meet the requirements for the assistant grade and must have an additional four years of training or experience.

The written examination for assistant grade will be held in the following subjects: mathematics, including statistics; chemistry; biology; physics; basic and advanced in the candidates' specialties. The written examination for senior assistant grade will be the same as for the assistant grade, with the exception of mathematics, which is omitted.

Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Bethesda Station, Washington, D. C.

These examinations offer opportunities for qualified veterinary graduates who may wish to enter public health work, and should be of special interest, perhaps, to recent graduates and army veterinary officers who may be anticipating release from military service.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

Nutrition Notes

There is an increasing abundance of feedlot evidence to support the hypothesis that yellow hybrid corn varies greatly in its carotene content, probably depending upon its genetic makeup.

The small difference in weight, and the added cost, lead to the conclusion that addition of grain is not justified when developing stock heifers are getting a full feed of silage. The feeding trial is reported in *The Kansas Stockman*, July, 1945.

Fowl-pox virus vaccine prepared in buffered mineral oil by Kerlin and Graham (*Am. J. Vet. Res.*, July, 1945) retained its viability for thirteen months. Takes were observed in 93 per cent of birds vaccinated with it, and resistance to artificial exposure with fully viable virus was demonstrated in 96 per cent of the vaccinated birds.

It requires more U. S. P. units of vitamin A activity in the form of carotene than in the form of true vitamin A to meet the physiological needs of four-footed animals. In the case of poultry, there is ample evidence which shows that the two forms are for all practical purposes equally effective. —*From R. M. Bethke, Proceedings Ohio Animal Nutrition Conference*, 1944.

That the value of special vitamin supplements for calves can be either acclaimed or disproved only after much more information has been presented is the conclusion reached by workers at Cornell, as reported in *Guernsey Breeders' Journal* for July 1, 1945. Limited uncontrolled experiments at Wisconsin suggest a beneficial effect from feeding extra amounts of vitamins A and C, and niacin, while preliminary tests at Cornell do not indicate a beneficial effect. These workers believe that one would expect conditions to differ in this regard.

According to the Oklahoma Agricultural Experiment Station, good quality prairie hay has 85 to 90 per cent the value of alfalfa for milk production.

Leaching and bleaching are among the worst weather hazards affecting hay. It has been found that from 20 to 40 per cent of the nutrients of hay can be extracted by soaking in cold water. These nutrients being the most soluble are, therefore, the most important.

Blackstrap molasses is used most advantageously when it makes up not more than 5 per cent of the ration of lambs, but may be used economically at 10 or even at 15 per cent, if price is low in comparison to other feeds.—*From J. Agric. Res., July 15, 1945.*

The calf draws milk from the udder by exerting negative pressure, not by the compression action of the jaws. The suction or vacuum may be in excess of that required to milk a hard-milking cow mechanically. This was proved by Smith and Peterson (*J. Dairy Sci.*, June, 1945) when they inserted a tube in the mouth in such a way that it did not interfere with closing the jaws or moving the tongue, but did prevent formation of a negative pressure.

At the Wisconsin Experiment Station, it was found that the level of blood plasma ascorbic acid of the dairy calf seems dependent on the level of vitamin A, particularly when the vitamin A level falls below 0.10 mg. per cubic centimeter. An increased intracranial pressure and a markedly decreased ascorbic acid content of the cerebrospinal fluid was observed in vitamin A deficient calves. The increased intracranial pressure may explain the irritable spasmodic disposition observed in vitamin A deficient cattle.

Alfalfa Hay for Milk Production

When alfalfa hay is fed as the sole item of the ration, the dairy cow will produce from 50 to 85 per cent as much milk as when a part of the alfalfa is replaced with grain, even though there is no increase in the total digestible nutrients. Part of this decrease in production may be explained in view of the fact that the high producing dairy cow is unable to consume enough alfalfa hay to meet her energy requirements during the early stages of the lactation period; in addition to this, alfalfa hay is low in phosphorus, and any ration poor in phosphorus is known to reduce milk flow. The low fat content of alfalfa hay may be another factor, but is less well understood.

It was found that when 13 to 25 per cent of the total digestible nutrients of the ration were supplied by grain the milk production climbed to the expected levels. Ground soy beans provided the greatest response, but each of 12 different concentrates had a beneficial effect. Making up the phosphorus deficiency with added minerals failed to have the desired effect.—*From J. Dairy Sci., May, 1945.*

Trace Minerals from the Soil

Salt, calcium, and phosphorus supply the elements most likely to be absent from, or insufficiently abundant in, the rations of dairy cows. There are, however, certain trace minerals or secondary elements which are required to carry on the normal body processes. Iodine, manganese, cobalt, copper, and zinc are members of this group, says Prof. G. Bohsted (*Hoard's Dairyman*, July 10, 1945).

Most of the mineral requirements of the animal body are supplied by the feed, but supplemental feeding may be needed when the requirements are unusually high, or when the sources in the soil are so low as to leave the plants deficient. Lack of iodine causes goiter in calves and hairlessness in pigs; shortage of iron and copper causes anemia; insufficiency of cobalt also causes anemia and a typical unthriftiness; while an inadequate intake of manganese interferes with reproduction and lactation.

Only minute quantities of the trace minerals are needed. For example, a cow may eat 2 oz. of iodized salt containing 1 part iodine to 5,000 parts salt while eating some 30 lb. of grain and roughage, and so get 1 part iodine to 2.5 millions parts of feed.

Bloat in Dairy Cows

Cole and Kleiber, report in the *American Journal of Veterinary Research* (July, 1945), that they have found that bloat can be produced with ease. But they could not seriously bloat, regularly, a majority of animals on a given day, even when they used cows which previously had bloated. They conclude that in order to produce serious bloat a cow must eat a large amount of alfalfa in a short time.

Feeding hay before pasturing on alfalfa was not a certain method of preventing bloat; in fact, when alfalfa hay was fed it appeared to have no effect. Feeding Sudan hay was better, but even when 4 to 7 lb. of this hay was eaten during the two hours before pasturing, it did not remove the danger of bloat. Only when the cows had access to Sudan hay during all of the preceding night, and ate about 17 lb. per cow, was danger of bloat avoided.

Rumen pressures were measured with the aid of a special instrument called a tympanometer. Readings did not clearly indicate at what degree of ruminal pressure distress was manifested.

Riboflavin Deficiency in Swine

Riboflavin appears to be necessary for the normal growth and development of pigs because, when it alone is removed from a ration that otherwise appears to be satisfactory, the animals fail to gain weight and begin to lose their normal well-rounded appearance. These pigs vomit frequently, develop a diarrhea that may be of short duration, and the skin and hair coat become rough. Mottled erythematous eruptions appear, and are especially noticeable on the snout, behind the ears, in the groin, over the abdomen, and sometimes along the midline of the back. The areas of skin which are affected become reddish brown, and are scaly or scabby. A dense white wavelike opacity is found near the equator of the lens.

The condition may be readily corrected in the early stages by increasing the amount of green forage consumed, or by adding milk to the ration.—*From Nutrition Reviews, May, 1945.*

EDITORIAL

Association Leadership

To be a power, a professional society must plan, lead, direct. In our case, there is the additional matter of building up the public relations of an essential art. The veterinary profession in the modern world still lingers among the little-known, half-known, and unknown occupations. When a trip to a sick animal or dying drove is measured in terms of underfed, undernourished, or hungry people, veterinary medicine will be better understood by the general public. The intricate machinery of education, research, and manual training required in the prevention of hunger will then fall into the scope of common knowledge.

But that day has not arrived. In the average home, veterinary service is but vaguely known to exist. Its bourne is not even agreed upon among ourselves. Impolitely told, the veterinary profession has a lot of public stupidity to overcome on its way to the inner sanctum of the public mind. The veterinary profession seems to have come down from the Renaissance with the wrong program. Principles have not always been put above fees. Pleading for the welfare of a profession (= a group of men) without indoctrinating its service to mankind as the *raison d'etre* was not brilliant strategy. It seems that all countries have been much alike in that respect. There have been, perhaps, too many things to do to plan well during the short life of organized veterinary medicine. There was a profession to form, an educational system to establish, scientific standards to adopt and maintain, regulatory laws to enact, industries to appease, and individuals of the right sort to attract into its membership. None of these jobs is complete. During the first century of formal veterinary education, the total personnel of the forming profession was like a corporal's guard, just a scattered few, and right up to 1945, the importance of the task essayed far exceeded the manpower required for its proper execution. That is, the vast field of producing, salvaging, preserving, and processing food grew far beyond the reach of a few college-trained doctors of veterinary medicine. In the midst of the development, the public was not concurrently educated as to its main objective—the preservation of domesticated animals and man's dependence upon them. Only agriculture was taken into its councils and it was swallowed up as a component thereof, instead of remaining the servant of all mankind. As far as the general population was concerned, its work has remained obscure. And, that's what the associations have to overcome from here on, not only for farmers but for all men. The fields of food hygiene and of public health are not agrarian. Difficult as it may be, the exact place where veterinary medicine belongs has to be drilled into the public conscience. The task is to rationalize veterinary service—fit it into the socio-economic scheme of the modern world. There is nothing to deter us except demerits of our own making and the exploitations of selfish interests. These are in the hands of the associations to handle. There is no other leadership. In the English speaking countries, for example, who can unite these task forces into stronger federations than the AVMA in the United States and Canada, and the national association of Great Britain and Ireland abroad? Moreover, on account of the ravages of war, unprecedented for the destruction of wealth which agriculture must restore, the world's veterinary services may well look to these associations for guidance and leadership.

Summed up, the postwar task is to make the general interest in veterinary medicine the war has aroused the starting point of a new era wherein building up universal understanding as to what veterinary science has in store for the good of mankind will be foremost in the profession's agenda. Once accomplished, the agencies exploiting veterinary medicine for selfish gain will vanish spontaneously.

This is a plea to join an association, and to take an active part in its development.

CURRENT LITERATURE

Abstracts

A Neglected Research in Dairy Science

Erroneously, says the author (in effect), lactation is not regarded as an integral part of reproduction. The dairy scientist does not take the trouble to investigate the interdependence between heavy breeding and mammary disease. The health and life of the dairy cow is imperiled in many ways by the heavy load she carries. Pathologically, abortion, sterility, and mastitis are inseparable. Mastitis is almost unknown in beef cows. On the other hand, the dairy cow that is forced beyond the level of endurance may abort, may become sterile from metritis, may be discarded, or die from mastitis. The dairyman strives to have the dairy female calve when half grown, and then produce a calf every ten or eleven months and yield fifty or more pounds of milk daily. "Then he expects the veterinarian to prescribe some vaccine, hormone, vitamin, or other fantastic nostrum which will enable a 'one ton cow' to carry a 'three-ton load over a rough road at high speed'." The author wants this to be compared with other farm animals which have but to nurse their offspring from birth to weaning.—[*W. L. Williams, New York State Veterinary College: An excerpt from Recollections of, and Reflections upon, Sixty-Five Years in the Veterinary Profession. Cornell Vet.* 35 (*April, 1945*) :167-190.]

Control of Infection in Wounds by Surgery and Chemotherapy

In an investigation of 1,000 wounds during the battle for the Gothic Line, the organism of initial sepsis was found to be *Staphylococcus pyogenes aureus. Streptococcus pyogenes* (hemolytic streptococcus) was rarely found.

The incidence of infection in wounds before operation at the Casualty Clearing Station was about 51 per cent.

In wounds undisturbed during transit, and treated at the C.C.S. by operation alone, 49 per cent were infected and 23 per cent were septic; by operation and sulfanilamide powder, 43 per cent and 11 per cent; by operation and penicillin-sulfathiazole powder, 25 per cent, and 7 per cent when examined in the base hospital five to ten days later. Thus, operation alone did not completely remove infection from a recent wound. Its effect was to leave the wound in the best possible condition for dealing with the infection that remained. Sulfanilamide applied locally had a bacteriostatic effect; for although the infecting bacteria persisted, their activity was depressed, so that the incidence of sepsis was reduced. Penicillin-sulfathiazole powder similarly applied was more effective, for its use was followed by the destruction of the infecting cocci in about one half of the infected wounds, with an equally low incidence of sepsis.

Wounds operated upon at the C.C.S. in under twelve hours had a lower incidence of infection than those operated upon between twelve and twenty-four hours, in all the chemotherapy groups. The length of time between wounding of the patient and his arrival at the base hospital was found to make no significant difference in the infection rate.

Wounds that had been re-dressed between C.C.S. and base hospital had a higher incidence of infection than had those that had not been disturbed.

The importance of control of infection by operation and chemotherapy at the C.C.S. is illustrated by the results of suture. The presence of pyogenic organisms in the wound at the time suture was performed had an adverse influence on the result obtained. Of wounds uninfected with these organisms, 80 to 85 per cent obtained Grade I union, whether appearing clean or dirty; whereas wounds that were infected, even if appearing clean, showed a lower rate of success.

The presence in wounds of staphylococci possessing some measure of resistance to penicillin did not influence the results of suture when penicillin was employed locally in the wound.—[*F. H. Bentley, F.R.C.S., and Scott Thomson, M.D.: Control of Infection in Recent Wounds by Surgery and Local Chemotherapy. Brit. M. J., No.* 4396, (*April* 7, 1945): 471-474.]

The foregoing summary is called to our attention by Dr. H. W. Schoening, who also gives the following explanatory remarks: "The battle for the Gothic Line is stated in the article to have been fought during wet weather on cultivated ground. A 'clean wound' is defined as one that had the naked eye appearance of a wound recently operated upon, and showing no reactive changes. A 'dirty wound' was one in which the surface was covered by tissue exudates; 'infected wound' was applied to one in which the presence of pyogenic cocci (*Staphylococcus pyogenes aureus* or *Streptococcus pyo-*

genes) was determined by deep cultures. A 'septic wound' is defined as a dirty wound infected with pyogenic cocci. About half of the dirty wounds were classified in this category." —EDITOR.

Heterogeneous Livestock Regulations

Uniform regulations for imported livestock is a question of mounting importance and far from being settled. Basic principles ought to be uniform. Both veterinarians and stockmen are to blame and there is no legitimate reason why they shouldn't agree. Where regulations are drawn up by stockmen, confusing health regulations ensue. That traffic barriers have taken the guise of health regulations in a few instances may not be true. The cause of the discrepancies is lack of knowledge of the livestock-disease situation in the various states and lack of uniformity of their veterinary service. The tendency is to "play safe" through stringent regulations against states that do not have an adequate disease-control service, and there will be no reform until a central department of livestock vital statistics is put into operation. The framers of uniform regulations must be taken out of politics, put on a professional basis, and be adequately financed. They should be under the jurisdiction of the U. S. Bureau of Animal Industry which, in addition, should give greater support to the state services. A set-up such as the U. S. Public Health Service is promoting in coöperation with state health agencies is suggested for animals. The custom of giving the most help to those states that do not help themselves is a subsidy on neglect and a penalty for the worthy. Moreover, accredited veterinarians ought to be given a more definite place in the control of dangerous animal diseases within their state.—[*J. A. Butler, D.V.M., Secretary and Executive Officer, Montana Livestock Sanitary Board, Helena, Mont.: Uniform State Regulations of Imported Livestock. Vet. Med., 40 (August, 1945): 274-275.*]

Books and Reports

Parasites of Domesticated Animals

This is the first text or reference in English which deals adequately with the parasites of North American animals. It adds to veterinary literature a volume which can be used as a means of identification in general practice. The veterinarian in practice encounters parasites in known hosts and in certain body organs and tissues, and it is therefore logical to classify parasites on a body-systemic basis. The table of contents does this, and then the tabulation itself gives the scientific specific name, common name, classification, location in organs or tissues, hosts, and size. It should be a useful addition to the library of every practicing veterinarian.—[*List of Parasites of Domestic Animals of North America. By Edward A. Benbrook, Professor of Veterinary Pathology, Division of Veterinary Medicine, Iowa State College, Ames, Iowa. 44 pages, mimeograph. Spiral wire binder. Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn. 1945.*]

Food Regulation and Compliance

Food regulation is not new, but since Ptolemy II exercised his version of strict control over the markets in the Nile delta it has become so complex that anyone engaged in any phase of the food industry finds it difficult to understand the statutory requirements under which he operates. This book presents the facts regarding legislation in such a way as to enable the producer of a product, and the distributor, to understand the requirements for it.—[*Food Regulation and Compliance. By Arthur D. Herrick. 646 pages. Cloth. Revere Publishing Co., New York, N. Y.*]

Medicinal Products

Prepared in harmony with the Good Neighbor Policy and designed for the Spanish and Portugese speaking Americas, this publication has just been released by the Drugs and Pharmaceuticals Unit of the Bureau of Foreign and Domestic Commerce, Washington 25, D. C.

The listing includes biological products, alkaloids, and other chemicals as well as vitamins, glandular products, and many specialties. Many pharmaceutical products, mainly of European origin, are listed in columns in the following order: (1) the products according to the titles used in the Spanish Americas; (2) the composition, description, or chemical name of each product; (3) the titles of the respective products as used in the United States of America; (4) replacement products obtainable from the United States where identical products cannot be found; (5) the key numbers of the manufacturers and suppliers in the United States of America.

The information is listed for the guidance of the interested Latin American professions as to the source of supply of United States products which can and should replace the European medicinals now relatively unavailable in Latin America.—[*Medicinal Products—United States Equivalents and Alternatives. Edited by George R. Tompkins, assisted by S. N. Samuelson, U. S. Department of Commerce. 107 pages. Paper cover. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 50 cents.*]

THE NEWS

Serves on Control Council for Germany

Dr. W. A. Hagan was invited to serve his country as a consultant on the Control Council for Germany, an invitation that was accepted as soon as permission to leave his post as dean of the New York State Veterinary College had been granted by President Edmund Ezra Day of Cornell University. He left by plane for Germany about August 15.

Dr. W. A. Hagan

The Control Council is set up with a number of divisions, one of which is Public Health and Welfare, under the direction of Major General Stayer, formerly chief health officer of the Canal Zone and more recently chief surgeon of the Mediterranean Theater. The Control Council has two functions, to formulate policy and procedure for all of Germany, in conjunction with the British, Russians, and French, and to insure that these functions are properly carried out within the United States' zone. Matters of broad policy will be the concern of the staff of consultants, since Army personnel and German civilians will be utilized largely for carrying out the programs.

Over the years, Dr. Hagan has served the Association and the veterinary profession in many ways. His influence has been felt on a number of committees, but particularly on the Committee on Education of which he has been a member since 1938. The Executive Board first learned to know him in 1942, when he filled an unexpired term for District 9, to which he subsequently was reëlected for a full term of five years. In 1943, Dean Hagan was granted a leave of absence from Cornell for one year, in order to act as special consultant to Chief A. W. Miller, Bureau of Animal Industry, U. S. Department of Agriculture. In August, 1944, he was elected chairman of the Executive Board, and his inability to preside at the August, 1945, session was regrettable.

His many friends in the AVMA and throughout the profession extend to Dr. Hagan their best wishes for a successful mission and their sincere conviction that he will discharge these new duties with commendatory credit to himself and to all veterinarians.

Dr. M. G. Fincher is acting dean during Dr. Hagan's absence.

Can You Help Locate These Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be great appreciated.

Adams, Carroll E., General Delivery, Ontario, Ore.

Ament, Roland W., 448 S. Hill, Los Angeles 13, Calif.

Amsiejus, Julius, General Delivery, Logandale, Nev.

Armistead, W. W., APO 11486—c/o P.M., New York, N. Y.

Beckcom, E. A. Jr., Station Hosp., Sq. H, Dale Mabry Field, Tallahassee, Fla.

Brekke, A. F., 7 Catherine Dr., R.F.D. No. 3, East St. Louis, Ill.

Bridges, Burlin C., 2nd Army Hdgs., Office of Surgeon, Memphis, Tenn.

Burnside, Otis H., Box 212, Greenville, Ala.

Caldwell, F. H., Peoria, Ill.

Chambers, J. W. Jr., 111 E. Woodin, Dallas, Texas.

Conway, James C., Box 182, Fort Branch, Ind.

Cox, Erston S., Blountsville, Ala.
Crippen, Donald A., 1312 Willard, Houston, Texas.
Croshaw, Ryland, Vincentown, N. J.
Dale, H. E., Guthrie Center, Iowa.
Day, W. E., 217 Pleasant Ave., St. Paul 2, Minn.
Eggert, Wm. E. Jr., Veterinary Station Hosp., Camp Hale, Colo.
Elliott, Herbert B., West Mansfield, Ohio.
Elmer, Everett K., D. Co. 2nd Bn., Camp Wheeler, Ga.
Fish, Richard B., So. Van Pelt St., Philadelphia, Pa.
France, Walker, Boonville, Ind.
Gafford, R. B., Casual Co. 97, APO 11358—c/o P.M., New York, N. Y.
Gillet, Veronica, c/o G. Brower, 6500 Cochite Rd., Pearock Ct., Albuquerque, N. Mex.
Goetsch, Gerald D., Sabetha, Kan.
Henderson, F. E., 2900 W. Sixth St., Little Rock, Ark.
Holbert, Robert W., Greeley, Iowa.
Kahl, Bernard D., Hamilton, N. Y.
King, Jack A., Station Veterinarian, Camp Swift, Texas.
Larson, K. E., Masonic Temple Bldg., Willmar, Minn.
Lerch, Robert J., 672 8 St., Brooklyn 9, N. Y.
McMichael, Wm. W., Portland AAB, Sqd. M., Portland, Maine.
McMillan, Thomas, Wichita Falls, Texas.
Macho, J. E., Box 452, Thompson Falls, Mont.
Majilton, E. A., 142nd General Hospital, APO 463—c/o P.M., New York, N. Y.
Miller, M. W., 425 Maryland Ave., St. Louis 8, Mo.
Moffat, G. C., Centuria, Wis.
Morse, C. F., 155-124th Ave., San Francisco, Calif.
Moughon, William C., Box 609, El Campo, Texas.
Nims, R. M., Macclenny, Fla.
Propp, Harold, APO 11331—c/o P.M., New York, N. Y.
Rubenstein, Abraham M., 1251 Euclid Ave., Miami Beach 39, Fla.
Sivyer, Roland E., 5935 N. Montana Ave., Portland 11, Ore.
Stefanick, J. E., Class 44—48B Box 135 VAAF, Victorville, Calif.
Steinman, F. C., APO 502, 292 Refrig. Co., c/o P.M., San Francisco, Calif.
Stephan, C. F., 519 Buckroe Rd., Phoebus, Va.
Taylor, Clarence L., ORB ASF Repl. Depot, Camp Beale, Calif.
Thompson, Charles F., 603 22nd St., N. W., Washington 7, D. C.
Thompson, E. E., 1021 Grove Ave., Richmond, Va.
Till, S. B., P. O. Box 705, La Grange, Ga.
Vierheller, Ralph C., 271st Bn., Kearney, Neb.
Weir, Howard T., Media, Pa.
Williams, J. M., Sqdn. M., 420th AAB Unit, Maxwell Field, Ala.
Wingerter, A. R., 27th Cav., APO 435, Ft. Clark, Texas.
Woodward, Willie D., Pullman, Wash.
Youree, F. R., Lebanon, Tenn.
Zook, Roy F., IARTC, Camp Howze, Texas.

Drs. C. C. Franks and E. E. Wegner Elected to Executive Board

Elections for Executive Board members in District V (Iowa and Minnesota) and District VII (Alaska, Hawaii, Idaho, Montana, Nebraska, North Dakota, Oregon, Philippine Islands, South Dakota, Washington, and Wyoming) closed on July 21, 1945. Drs. W. A. Young and E. R. Maschgan, of Chicago, served as a board of tellers on August 3 to count the ballots. They certified the following results:

Dr. C. C. Franks

In District V, Dr. C. C. Franks, of Des Moines, was elected to succeed incumbent Dr. F. M. Wilson of Mechanicsville, Ia.; in District VII, Dr. E. E. Wegner, of Pullman, Wash., was elected to succeed incumbent Dr. Chas. H. Seagraves, of Oregon City, Ore.

Neither of these men need an introduction to AVMA members. Dr. Franks is the chief of the Division of Animal Industry of Iowa and secre-

tary of the Iowa Veterinary Medical Association; Dr. Wegner is dean of the College of Veterinary Medicine, State College of Washington. Their elections are for five-year terms beginning at the conclusion of the annual meeting of the Executive Board which was held last month.

Dr. E. E. Wegner

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BAGUE, JAIME
Dept. of Agriculture & Commerce, San Juan, Puerto Rico.
V.M.D., University of Pennsylvania, 1914.
Vouchers: O. A. Lopez P. and N. S. Mayo.

DORSEY, T. A.
Dumont, Iowa.
D.V.M., Iowa State College, 1943.
Vouchers: L. P. Scott and S. Anderson.

HOLT, ALFRED L.
49 E. Main St., Oyster Bay, N. Y.
D.V.M., Cornell University, 1935.
Vouchers: A. Trayford and R. E. May.

HOULE, GERMAIN
Western Avenue, Augusta, Maine.
D.V.M., University of Montreal, 1943.
Vouchers: L. B. Denton and B. J. Cady.

Second Listing

Baker, Clifford W., Sanford, Fla.
Browne, Rupert R., U. S. Inspector's Office, c/o Swift & Co., South San Francisco, Calif.
Failing, Charles H., Chicago Q.M. Depot, 1819 W. Pershing Road, Chicago, Ill.
Goret, Pierre, 153 Avenue de Neuilly, Neuilly-sur-Seine (Seine), France.
Lightbody, Hugh M., 5424 S. Cornell Ave., Chicago 15, Ill.
McArthur, Francis X., Coupeville, Wash.
Simonnet, Henri, Rue de la Cite, Universitaire No. 9, Paris, France.

1945 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk(*) after the name of a school indicates that all of this year's graduates have made application for membership.

Ontario Veterinary College

HAWKE, T. W., B.V.Sc.
Box 793, Peterboro, Ont., Can.
Vouchers: H. Worton and R. A. McIntosh.

Second Listing

Michigan State College

Barlow, Robert F., D.V.M., c/o Elizabeth Fox, R.R. No. 3, Shelbyville, Ind.
Borst, George C. Jr., D.V.M., 24 Appleton St., North Quincy 71, Mass.
Burnham, Robert A., D.V.M., Crete, Ill.
Cropsey, Mac, D.V.M., Libertyville, Ill.
Eckman, Richard R., D.V.M., Onsted, Mich.
Hanson, Roland L., D.V.M., Beulah, Mich.
Parlin, Merl A., D.V.M., R.F.D. No. 1, Fulton, Mich.
Reeder, Carl E., D.V.M., 1127 Grant St., Eldorado, Ill.
Roberts, Charles L., D.V.M., Athens, Mich.
Wallace, Edward F. Jr., D.V.M., 186 S. Marshall St., Hartford, Conn.
Wasko, Edward D., D.V.M., 3153 Piquette, Detroit 11, Mich.
Williams, Ronald T., D.V.M., 2906 Kalamazoo Rd., S.E., Grand Rapids 8, Mich.
Williamson, Stanton P., D.V.M., 2621 Mishawaka Ave., South Bend 15, Ind.
Wright, Albert D., D.V.M., Wells River, Vt.

U. S. GOVERNMENT

Personal.—Dr. Willard H. Wright, chief of the zoölogical laboratory, National Institute of Health, has been "loaned" to the Surgeon General of the Army and assigned in the Southwest Pacific theater for duty as a member of a special commission charged to study schistosomiasis. Dr. Wright was an overseas veterinary officer in World War I. He was formerly with the zoölogical division of the BAI.

• • •

Food Consciousness.—On July 21, 1945, the Senate voted *viva voce* for United States membership in the Food and Agricultural Organization established by the allied nations in con-

ference at Hot Springs, Va., in 1943, and made a commitment to appropriate $1,250,000 toward the organization which already comprises 23 other countries. Fundamentally the purpose of the international coöperation is to find ways to improve the world's nutrition. Opposition to previous action was based on the old fear that the United States would surrender some of its freedom by participating in such a movement.

AMONG THE STATES

Alabama

Tuskegee Institute Expands Veterinary Service.—Dr. F. D. Patterson (I.S.C., '23), president of Tuskegee Institute, announces that in September a School of Veterinary Medicine is to be opened for selected Negro students. Dr. E. E. Evans (I.S.C., '18) is on leave of absence from his work with the extension service in Texas to assist in planning, building, and assembling a faculty.

A group of outstanding Negro veterinarians will become department heads on the new faculty, as the following list shows: Wm. H. Waddell (U.P., '35), Obstetrics and Ambulatory Clinic; G. W. Cooper (Colo., '18), Large Animal Medicine; Theo. S. Williams (K.S.C., '35), Pathology and Parasitology; L. C. Bowling (I.S.C., '20), Physiology and Pharmacology; T. G. Perry (K.S.C., '21), Small Animal Medicine, Surgery, and Clinic; E. G. Trigg (O.S.U., '22), Hygiene and Preventive Medicine; and L. B. Mobiley (K.S.C., '26), Anatomy and Histology.

Prof. E. E. Alexander will serve as instructor in Materia Medica and Pharmacy, and it is expected that three additional faculty members will join the staff in January, 1946. President Patterson will deliver a scheduled series of lectures on pathology, and the faculty will be augmented by visiting lecturers, who are outstanding in the veterinary profession, as well as by members of the Institute Schools of Agriculture and Science.

Arkansas

Man Dies of Rabies.—A Spitz dog was found on the highway and given to a small boy. The boy's father, Lee Whitlock, was bitten and then the dog disappeared. Mr. Whitlock took Pasteur treatments, but developed symptoms after having taken 14 injections, and he died three days later.—*From Dr. F. Hurlbut, Arkansas Gazette.*

British Columbia

The Cause and Control of Mastitis are being studied by the British Columbia Industrial and Scientific Research Council. Dr. J. G. Jervis, Milner, is chairman of the subcommittee to supervise the investigations. Types of organisms present have been studied in more than 2,000 samples of infected milk submitted by veterinarians. Experimental treatment will be tried.

California

Free Inspection for Packers. — Beginning Sept. 15, 1945, state inspection and slaughtering operations will be inaugurated under a bill just signed by Governor Warren. Funds to carry out the provisions of the act have been appropriated for the biennium of 1945-1947. Compulsory meat and packinghouse inspection has been in effect on a fee basis in all but a few northern counties which had a small population. The act is designed to enable independent packers better to compete with the large packing interests after the war. The new law abolishes fees charged the packers, and appropriates $450,000 for the two years mentioned.—*From National Provisioner.* [The expansion of the meat inspection system of California which has been outstanding over that of the other states is another step toward the extension of local food inspection service advocated by the AVMA.—Editors.]

• • •

Personal.—Dr. J. E. Stacy (Colo., '43) formerly of Gardner, Colo., has purchased Cook's Pet Clinic at 1511 Twenty-first Street, Sacramento. Dr. R. A. Cook (San Fran., '16) plans to retire from practice.

• • •

California First to Enact Practice Law?—Dr. John L. Tyler, resident AVMA secretary writes:

"In looking over the new directory, I became interested in the Section on State Boards and was surprised to find that California was the first state to enact a practice law, 1893. I had always presumed the Eastern States were much in advance of that time. I also know that three of my classmates, R. A. Archibald, D. F. Fox and H. F. Spencer, all C.V.C., 1891 graduates, were largely responsible for the passage, and all three served on the first board of examiners. The history of the veterinary profession in California, long isolated out here on the West Coast and removed from the sophisticated East, is to us Californians a matter of great pride and is most interesting."

[The data on veterinary practice acts in the 1945 Directory (pp. 25-33) were supplied by the respective state and provincial examining boards. The questionnaire sent to them included the question, "When was your veterinary practice law first enacted?" The dates given in the Directory are therefore based on the replies received.

In Canada, the province of Manitoba reports the enactment of a practice law in 1890.

Can any one substantiate the enactment of a

state veterinary practice law prior to 1893? —Ed.]

• • •

What Is a Drug Store?—At a meeting of the California Pharmaceutical Association in Los Angeles in June, steps were taken to limit the designations "drugs" or "pharmacy" to stores having a certain percentage of drugs to total volume of trade, on the grounds that the pharmacist is losing his standing as a professional man by going too far afield of his profession to engage in merchandising. The enactment of laws to bring about the change was advocated.

• • •

Quarter Horse Show.—The Quarter Horse Show held at the Bonelli Ranch at Saugus, June 10, was an outstanding event of the equine circle of the state. Moreover, the Pacific Coast Quarter Horse Association took advantage of the occasion to complete its organization and planned to hold shows all the way from San Diego to Seattle, to promote the development of the breed. There were 110 entries owned by 62 contestants.

• • •

Transporting Thoroughbreds. — If satiated with the notion that transporting Thoroughbreds to and from race-tracks is a new idea, you've never heard of Lord George Bentnick of England who, in 1836, won advantages over competing owners by rushing his horses from track to track in a specially constructed horse van drawn by a four-in-hand, or six-horse hitch while others moved their horses overland on foot. He could compete at more meets and with fresh horses.

• • •

Santa Anita.—Despite the absence of eastern horses, the Santa Anita Park season which closed in June was pronounced a great success. Owing to the short season there were more horses than entries.

s/J. L. TYLER, *Resident Secretary.*

District of Columbia

Veterinarians in the News.—Dr. C. D. Lowe, of the Public Relations Committee, has sent three items from the daily press all of which mention the veterinarian and his work.

One tells *(Times-Herald)* about Dr. Rufus Humphrey who has joined his father, Dr. R. L. Humphrey, Mountville, Va., for the practice of veterinary medicine after completing his course at the University of Pennsylvania and spending a year and a half on the staff at his *alma mater.*

Another appears in **American Weekly** for June 24, 1945, and tells of an interview with Dr. H. J. Metzger, Rutgers University, in which some of the newer veterinary accomplishments are discussed in connection with the problem of putting more meat on the table of the average American family through the reduction of death losses from diseases among farm animals.

The third is a discussion of the procedure and cost of compulsory vaccination against rabies in the District of Columbia. This appears in the Washington Daily News for August 1, 1945, and the headline as well as the analysis presents the attitude of the veterinarians in an unfavorable light.

Illinois

The First Outbreak of Dourine.—The first outbreak of dourine on this side of the Atlantic occurred in 1885 in central Illinois, near Bloomington. About 100 cases had broken out when Dr. W. L. Williams diagnosed the disease and traced the source to a Percheron stallion imported from France. When first detected, a number of affected horses had already been shipped to far-away places in the West and Northwest, including Alberta. Thus new centers of infection were created which have not yet been entirely blotted out. Williams, however, acting as assistant state veterinarian, soon stamped it out in Illinois.—*From Cornell Veterinarian, April, 1945.*

• • •

Quadruplets in Chicago. — While conducting postmortem inspection of cattle, the veterinary inspector noted an exceptionally large uterus

being removed from a Holstein-Friesian cow. Upon opening the uterus, he found two male and two female fetuses, as shown in the picture. Dr. G. M. Lint who sent us the story and the picture adds that these are the first bovine quadruplets he has observed in more than thirty years service in the Meat Inspection Division.

• • •

Dr. Brewer to University of Chicago.—Dr. N. R. Brewer (M.S.C., '37), formerly on the staff of the animal pathology laboratory of the California State Department of Agriculture, Sacramento, accepted a position as director of animal quarters, effective August 1, 1945, with the Division of Biological Sciences, University of Chicago. In his new work, Dr. Brewer will

supervise the care of animals used in the experimental laboratories of the division. He is also designated as a visiting lecturer in physiology and will do part-time research.

• • •

Chicago Veterinary Corps Officers.—The sixth conference of veterinary officers met on the evening of August 21 to hear Dr. B. T. Simms, president-elect of the AVMA, discuss the progress of research in Johne's disease, coccidiosis, and parasitism of cattle. The talk was well illustrated with moving pictures, and the officers assembled were given a clear and concise understanding of advances that are being made.

• • •

Tuberculosis Tax.—The keen interest in the suppression of tuberculosis (human) is indicated by vote of 85 out of the state's 101 counties to levy a tax for that purpose under the law enabling counties to establish tuberculosis sanitaria. Six counties (Coles, Jo Daviess, Madison, Massac, Scott, and Warren) gave substantial majorities in support of the project.—*From Illinois Health Messenger.*

• • •

New Examining Committee.—The newly appointed veterinary examining committee of the Illinois Department of Registration and Education held its first examinations at 106 N. La Salle St., Chicago, on July 30 and 31. Forty-nine candidates presented themselves to the Board which is composed of Drs. C. N. Bramer, Evanston; L. A. Gray, Bushnell; and P. F. Meginnis, Champaign. An innovation which was favorably received by the candidates was a short discussion by Dr. Gray of the "extra-curricular" duties of the practicing veterinarian to his community, to his fellow practitioners, and to his clients.

Iowa

Personal.—Major Earl C. Ritter (I.S.C., '38), of Sumner, was awarded the Bronze Star Medal for meritorious service as a member of

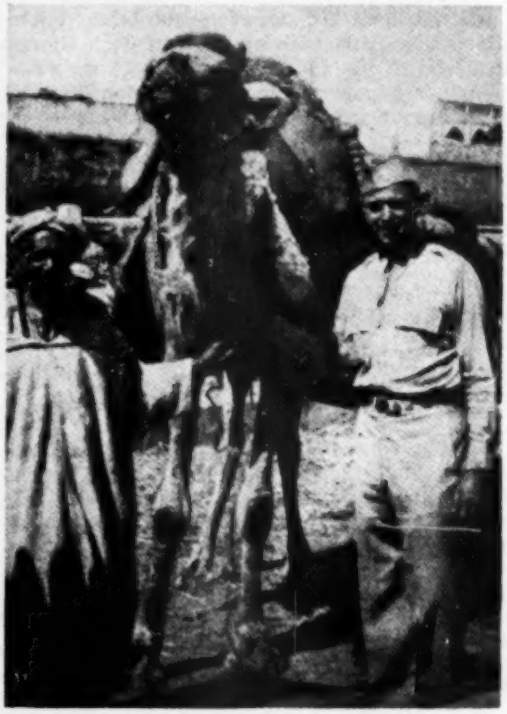
—*From Iowa Veterinarian.*

Major Earl C. Ritter

the Veterinary Corps in the Chinese Combat Command, where he was engaged in the Salween campaign which drove the Japs from Yunnan province and helped in opening up the Stillwell Road.

• • •

Personal.—Captain Benjamin Rosenfeld (I. S. C., '37) Osage, has served in the Veterinary Corps through the African and the Italian



—*Iowa Veterinarian.*

Captain Rosenfeld with His African Jeep and Chauffeur.

campaigns. In addition to spending more than a year in these areas, he has had an opportunity to visit Paris and some other parts of France, the Iowa Veterinarian tells us.

• • •

East Central Veterinary Medical Association.—At a recent meeting the Association heard the story of epitheliogenesis imperfecta neonatorium in a herd of Hostein-Friesian cattle, which had been fatal to a number of calves. The story was told and the pathological specimens shown by Dr. Wm. S. O'Brien, of Ryan, in whose practice the rare disease was encountered and recognized.

• • •

Move Pigs to Clean Ground.—Infectious Animal Disease Bulletin No. 480 of the Eastern Iowa Veterinary Medical Association reminds veterinarians to recommend that pigs be moved to the clean ground of the stubble fields soon after threshing, as a sound sanitary measure.

Kansas

Districts VI and VII.—Veterinarians from these districts were entertained June 1, 1945

at Topeka. Dr. John L. Wells, Kansas City, spoke on current practice problems, and then acted as chairman of a round-table discussion of these problems. Dr. Frank B. Jones discussed and demonstrated "Saddle Horses and Their Way of Going."

• • •

District IV.—Dr. Edward Bardshar entertained the district group with a steak dinner at his farm, on June 9, 1945. There were a few case reports and a general discussion, but the steak dinner was the highlight of the meeting.

s/ E. L. BOLEY, *Reporter.*

• • •

Identified.—Several friends of Capt. Elwin R. Prather (K.S.C., '41), of Eureka, have advised us that the "unidentified veterinary officer" whose picture appeared on page 116 of the August issue of the JOURNAL is none other than Captain Prather. Dr. E. A. Tunnicliff reports having seen him in Kunming late in May, headed down country toward the Burma border.

• • •

Meat Inspection Law.—Packing plants operating under full state inspection in accordance with the law passed by the 1945 legislature may be certified by the U. S. Department of Agriculture, and thus be permitted to slaughter animals without regard to quotas and to ship their products in interstate commerce. —*Bulletin of the Kansas Veterinary Medical Association* from *Topeka Daily Capital.*

Maine

Maine Veterinary Medical Association.—The summer meeting was held July 18, 1945, at the hospital and residence of Dr. and Mrs. A. E. Coombs, Skowhegan.

Capt. R. A. Maxwell, base veterinarian, Presque Isle, discussed encephalitis in dogs. The program was followed by a lobster dinner and a theater party.

• • •

Medical and Veterinary Medical Associations Meet Jointly.—Dr. I. Forrest Huddleson, Lansing, Mich., spoke on brucellosis at a meeting of the Cumberland County Medical Association. At least 17 members of the Maine Veterinary Medical Association availed themselves of the invitation to attend.

Maryland

Fungicides and Insecticides should be stored in a safe place away from children and livestock, and leftovers must be disposed of safely. Extension pathologists at the University of Maryland suggest that sod be dug up with a shovel, the fungicide be poured underneath, and then the sod be replaced. Containers and utensils also should be carefully washed and rinsed.

Michigan

Western Michigan Veterinary Medical Association.— The Association, meeting once a month under the guidance of President E. E. Hamann and Secretary Paul Howard, met at Grand Rapids in March to hear Dr. A. J. Parker, chief of staff at Butterworth Hospital, discuss socialized medicine. In April, at Holland, Dr. C. F. Huffman, Michigan State College, reviewed the factors of dairy cattle nutrition. In MAY, Dr. Emerson, of the Pasteur Institute, at Ann Arbor, read a paper on rabies, illustrating his remarks with moving pictures. This meeting was held at Grand Rapids. The June meeting was held at Charlotte, with Dr. A. E. Erickson as host.

• • •

Michigan-Ohio Veterinary Medical Association.—A panel discussion revolving around brucellosis and mastitis was held at Adrian. After the experts finished, practically everyone present joined in the spirited discussion which followed.

• • •

Saginaw Valley Veterinary Medical Association.—A meeting was held at Flint, with 34 members present. The principal topic discussed was the activity of the State Bang's Disease Control Committee, sponsored by the purebred cattle breeders' organizations in the state. Several motions were passed in the hope that they would help to guide the activities of the committee.

s/C. F. CLARK, *Resident State Secretary.*

• • •

Short Course.— Plans are tentatively being formulated to hold a short conference for veterinarians at Michigan State College in January, 1946. As yet, it has not been definitely determined that such a conference will be held, but hopeful plans are being pushed.

• • •

Speaks on National Network.—Dr. I. Forrest Huddleson, East Lansing, will soon be a guest speaker on the program, "The Doctors Talk It Over"; his subject will be "Undulant Fever." This program is broadcast regularly on Friday at 10:30 p.m., E.W.T., over the American Broadcasting Company network, and is sponsored by the American Cyanamid Company.

[The talk had been scheduled for August 10, 1945, but was not broadcast at that time due to cancellation of regularly scheduled network broadcasts to make room for the momentous news reports of the Japanese capitulation. No new date had been assigned as we go to press.

Contacts such as this add impetus to our professional public relations program.—Ed.]

Minnesota

Inspector In Charge Retires.—Dr. W. J. Fretz, inspector in charge of veterinary field work of the U. S. Bureau of Animal Industry retired on July 31, 1945, after spending almost

forty-five years in the federal service. Dr. Fretz was known as an able administrator, a forceful speaker, a good writer, and a relentless foe of animal diseases. He was particularly active in the campaign to eradicate bovine tuberculosis, and more recently in the program for suppressing brucellosis.

Missouri

Northwest Missouri Veterinary Medical Association.—A meeting was held May 22, 1945, at Maryville Country Club. The following program was presented:

Dr. C. D. Folse, Kansas City: "Sulfa Therapy and Pencillin."

Drs. J. W. Chenoweth, Bethany, and **L. F. Thompson,** Grant City, led a round-table talk on cattle practice.

Drs. L. R. Cundall, Fairfax, and **Ray Matkin,** Rockport, led a discussion of swine practice.

Dr. K. Sears, Maryville: "Small Animal Problems."

s/W. H. BAILEY, *Secretary.*

• • •

Veterinarians Entertained.—Dr. A. H. Quin, of Jensen-Salsbery Laboratories, entertained a group of veterinarians recently at the La Fonda Hotel, Kansas City, according to *Advertising and Sales Executives Club News.* His guests were Capt. Jack D. Bender, V. C.; Major Ben N. Winchester, V. C.; Major W. Lorber, V. C.; Lt. Col. E. S. Wiseman, V. C., President James Farquharson, of the AVMA; and Drs. S. J. Schilling and Gordon McPherson, of Jensen-Salsbery Laboratories.

• • •

Southwest Missouri Veterinary Medical Association.—An all-day clinic and a barbecue at noon were held May 28, 1945, at Will-O-Pat Farm, Joplin. Talks and demonstrations filled the day.

Dr. C. C. Moore, Carthage: "Examination of Clinical Cases of Sterility," and "Artificial Insemination."

Dr. R. B. Koger, Joplin: "Pregnancy Test." (Demonstrated).

Dr. G. R. Moore, Manhattan, Kan.: "Mastitis Diagnosis and Control," and "Anesthesia in Large Animal Practice."

Dr. W. F. Irwin, Tulsa, Okla.: "Small Animal Surgical Technique."

Dr. H. G. Stephenson, Independence, Kan.: "Epidural Anesthesia in Dogs."

s/C. P. MEREDITH, *Secretary.*

Nebraska

Livestock Sanitary Officials Meet.—Dr. Ralph L. West, Minnesota state veterinarian, told livestock sanitary officials from the North Central States that human infection of brucellosis (undulant fever) showed a decrease of 50 per cent in the area under strict control for brucellosis in cattle, but had increased as much as 200 per cent in other parts of the state. The meeting was held at Omaha, on June 6, 1945.

New York

Veterinarians Coöperate with Dog Owners.—The Public Relations Committee, of the N. Y. State Veterinary Medical Association, through its chairman, Dr. C. E. DeCamp, Scarsdale, has presented a new and interesting example of good-will and coöperation by offering to supply speakers for meetings of the American Kennel Club or its affiliated breed clubs. Such a speaker would discuss new medicinal preparations, recent discoveries in veterinary science, feeding, vitamin value, care of brood bitch, feeding puppies etc., and would answer questions.—*From Kennel Gazette,* May, 1945.

• • •

Sulfa Drug Sales Without Prescriptions.—The clamping down of over-the-counter sales of sulfa drugs by the New York City board of health was disapproved by a ruling of the Food and Drug Administration which permits the sale of certain preparations containing determined amounts of such drugs not hazardous to health. The ruling applies to ointments, nose drops, and bandages. New York City is also framing regulations barring the sale of penicillin preparations without a doctor's prescription.—*From Drug Topics.*

• • •

Bacteriophage Made Visible.—Alvin W. Hofer, of New York Agricultural Experiment Station, working with Oscar W. Richards, of the Spencer Lens Company, of Buffalo, has brought bacteriophage particles within the range of the electron microscope by means of a stain—auramin—and ultraviolet radiation. Bacteriophage particles were found to be larger than the flagella of bacteria but had escaped the eye under ordinary staining.

• • •

Governor Dewey Vetoes Objectionable Bills.—The tension over the passage of two bills by the state legislature to permit the granting of a medical license to graduates of any medical school in the United States was relieved when Governor Dewey vetoed the two measures, with a ringing message showing that medical practice is in no danger of bogging down just now. The episode is added proof that eternal vigilance is the price of advancement in the learned professions.

Ohio

Personal.—Lt. Col. John F. Gest (Cin., '16), Cincinnati, is station veterinarian at Camp

---

Digest-Index.—Master theses of importance to industry and research will be indexed under this name and made available by the National Research Bureau, 415 N. Dearborn St., Chicago 10, Ill. These will be available on microfilm.

—Signal Corps, U. S. Army.

Hood, Texas, where he has charge of inspection of all food of animal origin consumed at the camp. He is shown here in the act of introducing a sentry dog to a puppy which had been brought to the hospital for amputation of the tail.

• • •

Locker Plant Investigation.—Locker plant operators were notified by the OPA in April that beef, mutton, and veal must be graded unless the meat is already cut and ready for locker storage when turned over to them. The investigators found large quantities of beef in locker-plant coolers that was obtained without surrender of red stamps.

Pennsylvania

Personal.—Major Harry J. Robertson, V.C., U. S. Army, who received the Award of Merit for his activity in Iceland, was recently promoted from major to lieutenant colonel.

Philippines

Commercial Cargo Service Resumed. — The convenient commercial shipments by airplane from the United States before the Japanese invasion were resumed in August, subject to clearance priority *via* the American President Lines.

Puerto Rico

The First Board of Health on "this side" was established in the Province of Puerto Rico by a decree of the Spanish Crown in 1768, according to S. J. Crumbine, M.D. (*American Journal of Public Health*, April, 1945) in challenging the claim that Baltimore is entitled to that distinction. Smallpox vaccination was practiced in Puerto Rico in 1803, or seven years after Jenner's discovery.

Texas

Junior Chapter AVMA.—Officers elected for the summer term are: T. B. Carroll, College Hills, *president;* W. E. Crenshaw, Ed Couch, *vice president;* E. W. Grogan, Deport, *secretary-treasurer;* and G. T. Dugan, College Hills, *recorder*. The sponsors of the Chapter are three department heads: Dr. R. C. Dunn, Veterinary Pathology and Bacteriology; Dr. J. H. Milliff, Veterinary Anatomy; and Dr. R. D. Turk, Veterinary Parasitology.

S/DR. R. P. MARSTELLER, *Dean.*

• • •

Meat-Inspection Bill.—A bill which would give the Texas state board of health wide powers over compulsory enforcement of meat inspection has been approved by the House public health committee. . . The measure would prohibit the sale of meat for human consumption from animals suffering from visible diseases communicable to human beings. The state board of health would be given authority to examine all cattle, swine, sheep, and goats before slaughter, and to require stamping with a special label before meat could be sold.—*From The National Provisioner, April 14, 1945.*

• • •

Personal.—Capt. Fred Lester Molt (Tex., '39), formerly of Houston, was recently promoted to the rank of major in the Veterinary Corps.

Utah

Utah State Veterinary Medical Association.—The Forty-sixth annual meeting was held at Logan, June 25-26, 1945. The program included the following:

Dr. J. I. Curtis, Salt Lake City: "State Brucellosis Program."

Dr. A. J. Webb, Ogden: "Report of Committee on Mastitis Inspection with Its Relation to Public Health."

Dr. M. L. Miner, Provo: "Relation of Pathological Laboratories to the Practitioner."

Dr. R. A. Nipko, Salt Lake City: "Rabies."

Dr. Hugh Hurst, Salt Lake City: "Turkey Diseases."

Dr. Glenn C. Holm, Moscow, Idaho: "Mastitis," and "Atonic Indigestion."

Dr. H. C. Smith, Allied Laboratories, Sioux City, Ia.: "Penicillin." (Paper was read by Mr. Deakin).

Dr. D. M. Hammond, Logan: "Trichomoniasis and Coccidiosis in Cattle."

Dr. L. E. Harris, Logan: "Recent Developments in Mineral Nutrition."

Three motion pictures also were shown, "Science of Milk Production," by Purina Mills; "The Story of Phenothiazine," by E. I. DuPont

de Nemours & Co.; and "Vesicular Diseases of Animals," by U.S.B.A.I.

Officers elected for the coming year are: Dr. John I. Curtis, state veterinarian, Salt Lake City, *president;* Dr. Harry B. Mitchell, Brigham City, *vice-president;* and Dr. O. G. Larsen, Logan, *secretary,* (reëlected).

s/F. H. MELVIN, *Resident Secretary.*

Wisconsin

Southeastern Wisconsin Veterinary Medical Association.—The Association met on July 26 to hear Dr. A. L. Kleckner, of the Pitman-Moore Co., discuss mastitis. The meeting was preceded by a dinner served at Linden Inn, on Big Cedar Lake, Slinger, with Dr. A. J. Kletti acting as host and making the arrangements.

s/J. O. MCCOY, *Secretary.*

• • •

Southwestern Wisconsin Veterinary Medical Association.—The July meeting was held at Platteville, Dr. J. G. Hardenbergh, executive secretary of the AVMA, presenting some views on a method for coördinating the efforts of all veterinarians. Dr. Willis Thomson served as host, and Dr. Sam Elmer was program chairman.

• • •

Northern Wisconsin Veterinary Medical Association.—The Association went to Green Bay for its meeting July 31. Afternoon and evening sessions were held, and these were featured by reports by Dr. J. S. Healy, U. S. inspector in charge and Dr. V. S. Larson, chief, Wisconsin Livestock Sanitation Division.

Hon. John W. Byrnes, congressman from the 8th District, was guest speaker at the banquet.

s/WM. MADSON, *Secretary.*

• • •

Personal.—Dr. C. E. Blye has resigned his position with the State Department of Agriculture to accept work with the Ultra-Life Laboratories, Inc., East St. Louis, Ill.

• • •

Receives Military Discharge.—Dr. George K. Lang who served as a captain with the Veterinary Corps at Presque Isle, Maine, has been discharged from the Corps and has accepted a position with the State Tuberculosis Eradication Force, under Dr. V. S. Larson.

• • •

North Central Veterinary Medical Association.—At Chippewa Falls on July 25, 1945, forty members and their ladies were present to hear Drs. V. S. Larson, B. A. Beach, and J. S. Healy lead a lively discussion relative to the high lights of recent legislation and also new regulations.

Foreign

Belgium

Personal.—Capt. Sidney L. King, V.C. (O.S.U., '38), writes that he is now in Brussels, and has had an opportunity to do a little work on animals with Professor Liégnoise, at the veterinary college.

Germany

Kindness to Animals.—It fell to a prominent Berlin veterinarian, Dr. Wilhelm Henninger, to show that the finer things of life have not been deserted by all the German people. Berlin veterinarians, led by Dr. Henninger, a well-known anti-Nazi, have reorganized the Berlin Society for the Prevention of Cruelty to Animals and have launched a movement to obtain medicines and legal protection for the unfortunate animals. The JOURNAL wants to congratulate Dr. Henninger for far-sight that speaks louder than words, and reaches farther than the movement itself. Anyhow, it is a contrast to the die-hard Germans who are shooting down GI's in Bavaria from ambush.

Great Britain

Number of Veterinary Surgeons.—In reply to a question, Mr. R. S. Hudson told Parliament that there are 260 fulltime veterinary officers of the Ministry of Agriculture stationed in England, and in addition 596 private practitioners serve as part-time officers. For Scotland the numbers are 55 fulltime and 175 part-time, for Wales 44 and 76, respectively.

• • •

Two American universities — Harvard University and the University of Pennsylvania— recently awarded the degree of doctor of science to Sir Alexander Fleming, discoverer of penicillin.

• • •

Guernsey Herds Safe.—Because some 23,000 islanders stayed to face the German invasion, and because they formed a Farm Produce Board which controlled the cattle industry throughout the war, there was a decrease of only one cow from the prewar population, although the numbers of heifers and bulls had been reduced about half during the past five years. Birth and slaughter of calves have been rigidly supervised, so that the quality of the cattle has not been reduced, reports Basil C. de Guerin, in *Guernsey Breeders Journal* for July 15, 1945.

Sir Daniel Cabot, senior veterinary officer of the British Ministry of Agriculture, presented an offer to help them rehabilitate their stock and holdings, but it was voted not to import any animals to the Island at this time.

"Trash Fish."—Among the food potentials developed by the war is the utilization of "trash fish" which are usually discarded by fishermen: burbot, blue runner, whiting, and the small sizes of spot, trout, mullet, squid, and croaker, all highly nutritious and wholesome. These are made into a canned fish meal that is likely to be on the domestic market after the war.

India

'Wah' or Rheumatism occurs as a specific epizoötic in Sind, and is reported for the first time from India by H. S. Bawa in the *Indian*

—*From Indian Journal of Veterinary Science.*

Showing Swelling of Hock, Knee, or Fetlock Joints

Journal of Veterinary Science. It is characterized by rise in temperature, arrest of milk flow, and heat, pain, and swelling in the udder. Later there is painful swelling of the knee and hock joints. It is believed to be caused by a virus.

Russia

Sunflower Seed.—Though new to America, here sunflower seed is a staple farm product. It is hailed by nutritionists and farmers alike. The protein content is 52 per cent as against 40 per cent for the soybean. The plant grows readily and the yield is high. It is harvested by a machine that rivals the corn harvester.

STATE BOARD EXAMINATIONS

West Virginia—The West Virginia Veterinary Board will hold its next examination on Oct. 8, 1945, at the Daniel Boone Hotel, Charleston. All applications must be in the hands of the secretary not later than Thursday, Sept. 28, 1945. Address further inquiries to W. E. Trussell, secretary of the board, Charles Town, Jefferson County, W. Va.

Marriages

Dr. Myron S. Arlein (I.S.C., '38), 210 Riverway, Boston, Mass., was married to Miss Helen Jacobs, Irvington, N. J., on June 17, 1945.

Dr. Herbert Lothe (O.S.U., '13), Waukesha, Wis., and Mrs. Geo. Rasmussen, Lake Forest, Ill., were married recently. They will reside in Lake Forest.

DEATHS

R. J. W. Briggs (C.V.C., '02), 69, Ottawa, Ill., died July 16, 1945, following a brief illness. Dr. Briggs was a native of Iowa and spent most of his life in the service of the veterinary profession in that state. He had been a member of the AVMA since 1918.

Alonzo Goode (C.V.C., '08), 61, Milo, Ia., died May 17, 1945. Dr. Goode was a longtime resident of Milo, having begun practice there following his graduation.

L. J. Hinson, 55, McGehee, Ark., died Aug. 7, 1945. Dr. Hinson was a member of the Public Health Service of McGehee, and had served as a lieutenant in the Army of Occupation in World War I.

John G. Jackley (U.P., '10), 61, Compton, Calif., died in July 1944. Dr. Jackley was admitted to the AVMA in 1917.

J. M. Nelson (I.S.C., '08), 65, Sigourney, Ia., died June 2, 1945. Dr. Nelson was a native of Denmark, but came to Iowa with his parents when he was 6 years old. He took up practice in Sigourney the year following his graduation, and continued his work there until his death. Dr. Nelson was admitted to the AVMA in 1924.

William A. Rader (Gr. Rap., '16), 53, Port Huron, Mich., died Feb. 4, 1945. Dr. Rader was admitted to the AVMA in 1918.

W. H. Spencer (K.V.C., '11), 70, Yates Center, Kan., died July 5, 1945. Dr. Spencer was admitted to the AVMA in 1943.

W. F. Schwiesow, 65, Ripon, Wis., died June 29, 1945. He was a graduate of the Ontario Veterinary College, and had practiced in Ripon for the past forty-three years.

THE VETERINARY PROFESSION AND THE WAR

Redeployment and Separation of Veterinary Corps Officers

Note.—The following correspondence with the Office of the Surgeon General, U. S. Army, and excerpts from an official statement on policy relate to a problem which has concerned the Board of Governors and other AVMA officers for several months. Much study has been given to it, and the need for early return of veterinary officers to essential civilian practice, teaching positions, research work and other important activities has been generally recognized.

The original statement of Medical Department redeployment and separation policy, as revised August 6, 1945, contained a great deal of material relative to Medical Corp officers only, which has been deleted to save space. Since the statement was released, events which have taken place in the Pacific may possibly cause the policy and procedures to be modified materially.—Editor.

July 30, 1945.

MAJOR GENERAL NORMAN T. KIRK
SURGEON GENERAL OF THE ARMY
ARMY SERVICE FORCES
WASHINGTON 25, D. C.

DEAR GENERAL KIRK:

During the past year, we have received a number of letters from educational and research institutions, experiment stations and other organizations employing veterinary personnel, asking our advice and assistance in obtaining the release from military service of certain key men formerly on their staffs who are now serving as commissioned officers in the Army Veterinary Corps. Since V-E day, the number and urgency of these requests have increased.

Moreover, numerous veterinary officers formerly in private practice who have now served for extended periods are desirous of returning to their civilian pursuits as early as possible. The pressing needs of the livestock industry for veterinary service, which is at present unobtainable in many areas, makes it highly desirable that veterinary officers be released just as soon as the Army can dispense with their services.

We would greatly appreciate any information you can give us as to the possibility of replacing some of the officers in question with recent graduates.

Sincerely yours,

AMERICAN VETERINARY MEDICAL ASSOCIATION.

S/J. G. HARDENBERGH, *Executive Secretary.*

ARMY SERVICE FORCES
OFFICE OF THE SURGEON GENERAL
WASHINGTON 25, D. C.

August 11, 1945.

DR. J. G. HARDENBERGH
EXECUTIVE SECRETARY
AMERICAN VETERINARY MEDICAL ASSOCIATION
CHICAGO 5, ILLINOIS

DEAR DR. HARDENBERGH:

Receipt is acknowledged of your letter of 30 July, 1945 addressed to The Surgeon General and making inquiry with regard to the release of veterinary officers from military service.

I am transmitting herewith for your information a statement of Medical Department redeployment and separation policy, revised 6 August, 1945, which has just been released.

The Surgeon General wants you to know that the importance and desirability of returning veterinarians to college faculties, various institutions and organizations, and to essential private practice, are thoroughly recognized and the policy is to accomplish separations as rapidly as military necessity will permit.

Sincerely yours,

S/ROBERT J. CARPENTER
Colonel, Medical Corps
Executive Officer.

EXCERPTS FROM POLICY STATEMENT

V-E Day found the War Department with approximately 65 per cent of its Medical Corps officers overseas, the largest number in the European and Mediterranean theaters, the others principally in the Pacific. Some time prior to the announcement of V-E Day the

War Department had completed its planning for redeployment, readjustment, and discharge. This plan provided for discharges of enlisted personnel in relation to the declining requirements of a one front war, based on length of service, length of overseas service, combat activity, decorations, and number of dependents. The composite score was known as the Adjusted Service Rating. The separation of officers was not tied down initially to a specific Adjusted Service Rating although the War Department desired that, within the limits of military necessity, substantially the same type of equitable, objective considerations should govern.

The War Department's pre-V-E Day planning also laid down the principles to govern the movement of personnel out of the European and Mediterranean theaters once victory was achieved. Military necessity, governed by consideration of transportation and the strategic requirements of the Pacific, scheduled the movement of a considerable number of troops directly from Europe to the Pacific. This was particularly true of service troops—the Engineers, Signal and, to a lesser degree, Medical Personnel—which were to prepare the way for the large inflow of divisions which would arrive in the Pacific after a short period of furlough and retraining in the United States.

* * * * * * *

The Medical Department picture was, however, markedly different. Cognizant of these differences the Surgeon General requested and received permission to exchange personnel in the units coming through the United States to the Pacific on the condition that the units would be able to perform their mission at the time they left this country.

* * * * * * *

To implement the restaffing of units scheduled for the Pacific coming through the United States, a complete census was undertaken of all personnel stationed in the United States. On the basis of this census and in light of experience to date, criteria were established for withdrawing personnel from units passing through the United States and for assigning personnel now in the United States to the units scheduled for the Pacific.

These are only general rules and are subject to exception in any case due to military necessity, and to change if subsequent developments should make such action necessary. They are not to be understood as creating any right in an officer to continue on duty in this country if military needs now or later should require his assignment to other duty. Subject to these qualifications, the plan for withdrawal of officers from units and for new assignments is shown in the accompanying table. (Table 1.)

* * * * * * *

Intimately associated with the problem of redeployment are problems of readjustment and discharge. Reference has already been made to the fact that the original plan of the Surgeon General contemplated the sending of replacements to the Pacific at the earliest possible date, in order to permit the return to the United States of personnel who have had long overseas service.

TABLE 1—Plan for Withdrawal and Assignment of Officers

Corps	Age		Adjusted Service Rating		Overseas Service V-E Day (Mos.)	
	Withdrawal	Assignment	Withdrawal	Assignment	With-drawal	Assign-ment
Medical Corps.....	45 or over	44 or under	75 or over	74 or under	12	0
Dental Corps.....	40 or over	39 or under	50 or over	49 or under	6	0
Medical Administrative Corps....	40 or over	39 or under	50 or over	49 or under	6	0
Sanitary Corps....	40 or over	39 or under	50 or over	49 or under	6	0
Veterinary Corps..	**40 or over**	**39 or under**	**50 or over**	**49 or under**	**6**	**0**
Army Nurse Corps	40 or over	39 or under	30 or over	29 or under	6	0
Physical Therapists Corps	40 or over	39 or under	30 or over	29 or under	6	0
Medical Department Dietitians	40 or over	39 or under	30 or over	29 or under	6	0

The separation plan of the Surgeon General had to deal, therefore, not only with numbers but also with classes of personnel. On the basis of detailed studies it was decided that it would be best to establish two classes—one for scarce specialists, the other for nonscarce specialists and general duty officers—and to set a definite score for each, so as to keep under strict control the outflow of scarce specialists. Consideration was given at one stage of the planning to prohibit the release of any officers in the scarce class, but it was believed better to plan where possible to release very high score individuals as well as those over 50 years of age, irrespective of specialty, so long as the number of such releases would not endanger the efficiency of the medical service. The list of scarce specialists was kept to a minimum, after a review of worldwide requirements and availabilities.

Although readjustment regulations place responsibility on the Chief of each Technical Service for the establishment of separation policies, the Surgeon General felt it incumbent on him to establish a representative

Separations Board and to charge this board with developing a series of objective criteria which would insure the continuation of high medical standards during the Pacific war and, at the same time, provide an equitable basis for the separation of surplus officers. The Deputy Surgeon General was designated Chairman of the Separations Board, and representatives of the three major forces—Army Air Forces, Army Ground Forces, and Army Service Forces—were made members of the Board.

ESTABLISHMENT OF SEPARATIONS BOARD

The Board thoroughly explored all aspects of the separation policy and had at its disposal comprehensive statistical material before deciding the criteria for separation.

The Board decided to establish definite criteria for separation, subject, as above stated, to the limits of military necessity which governs all discharge policy. These criteria, therefore, create no vested right in any officer to discharge but constitute the goal to be sought, and the general rules to be applied in the absence of supervening military necessity. Such necessity may exist as to the time when, in any individual case, this step can be taken. Also it may arise from the possible need for a relatively few officers with irreplaceable experience whose usefulness is so great as to transcend individual consideration. Separations will be considered by the Surgeon General's Office and granted within the above principles wherever possible. The criteria hereafter set forth and all provisions of the present statement of separation policy must be read and understood as subject to the above qualifications.

* * * * * *

Subject to the general qualifications stated, the accompanying table (table 2) summarizes the criteria for separation established for all Medical Department Corps.

TABLE 2—Criteria for Separation

CORPS	AGE	ADJUSTED SERVICE RATING
Medical Corps*	50 or over	100 or over
Dental Corps	45 or over	100 or over
Medical Administrative Corps	45 or over	90 or over
Sanitary Corps	45 or over	90 or over
Veterinary Corps	**50 or over**	**110 or over**
Army Nurse Corps†	40 or over	65 or over
Physical Therapists Corps†	50 or over	65 or over
Medical Dietitians Corps†	50 or over	65 or over

*Scarce categories, A. S. R. 120.
†The following additional provisions cover separations: dependent children under 14; married to demobilized allied personnel.

As in the case of Medical Corps officers, the Army Service Forces, for the time being, have not placed into effect the age provision for Dental Corps officers, and they are operating under a score of 110. But it is hoped that this exception can be removed later.

The foregoing criteria outlined here have been established for an initial period of several months, and the point score will be reduced when the number of surplus personnel returned from the European and the Mediterranean theaters makes this possible.

During recent weeks every effort has been made to speed the return of surplus personnel from the European and Mediterranean theaters so that a maximum number of Medical Department officers, especially Medical Corps officers, can be returned to the United States for reassignment and separation.

* * * * * *

The rates at which Medical Corps and other Medical Department officers are separated are conditioned largely by the Pacific. If the Pacific did not exist, or if it could be ignored, as it clearly cannot, separations could be accelerated by approximately five months or more. When a surplus officer with a high score returned from Europe, he could be discharged. But if there are individuals with higher scores in the Pacific, a different procedure is indicated. The officer returning from the European theater, instead of being separated upon arrival, is granted a thirty day leave, plus an allowance for travel time from the port to home and from home to his new station. The individual who has not yet been overseas is granted a preëmbarkation leave of approximately fifteen days, which, when added to his travel time to the port and the period preparatory to sailing, amounts to approximately one month. Here we have two months. The trip overseas requires just under a month, or a total of three months. Travel time from the port to the new station in the Pacific, overlap on the job and travel time to the port of the officer returning to the United States eat up another month, or a total of four months. The trip home requires another month, or a total of five months. This is the minimum if the officer is separated on arrival. But if his points should be below those of an officer currently assigned in the United States, the process continues. The officer returning from the Pacific will receive a month's leave, additional travel time to and from his home, and only after he has been at his new station for approximately two weeks will the high score individual be released for separation. Here we have a total of seven months. Equity in separations means delay in separations of between five and seven months. Here is the explanation for the apparent paradox of how it happens that two months after V-E Day surplus medical personnel is just beginning to be released from the Army and why it will take many months before all of the surplus is finally

separated. However, it is the Surgeon General's firm belief that the American public and the entire medical profession feel that the War Department's basic program of readjustment which includes the Pacific is sound and just.

Veterinary Officers Retired

The Office of the Surgeon General reports that the following Veterinary Corps officers of the Regular Army have been, or will be, retired on the dates specified, and submits these brief service records.

Colonel Burlin C. Bridges was born June 24, 1893, at Grant, Wis. He received his degree of D.V.M. from the Chicago Veterinary College in 1915. He was commissioned a second lieutenant in the Veterinary Reserve on June 20, 1917, and called to active duty on July 19, 1917. During World War I, Colonel Bridges served with the AEF in France. He accepted appointment as a first lieutenant in the Regular Army on September 17, 1920, and was assigned to duty with the Remount Purchasing Headquarters in Oklahoma. In 1925, he was transferred to Fort Bliss, Texas, and later served at the following stations: Fort Riley, Kan., Fort Oglethorpe, Ga., and Fort Ethan Allen, Vt. He also served a tour of duty in Hawaii. He is a graduate of the Cavalry School, class of 1930, and the Army Veterinary School and Medical Field Service School, class of 1931. Colonel Bridges attained the permanent grade of colonel on July 19, 1943. He served as Depot Veterinarian at the Front Royal Quartermaster Remount Depot, Virginia, and was on duty as Army Veterinarian with the Second Army, Memphis, Tenn., at the time of his hospitalization, subsequent to retirement. He was retired for physical disability on June 30, 1945.

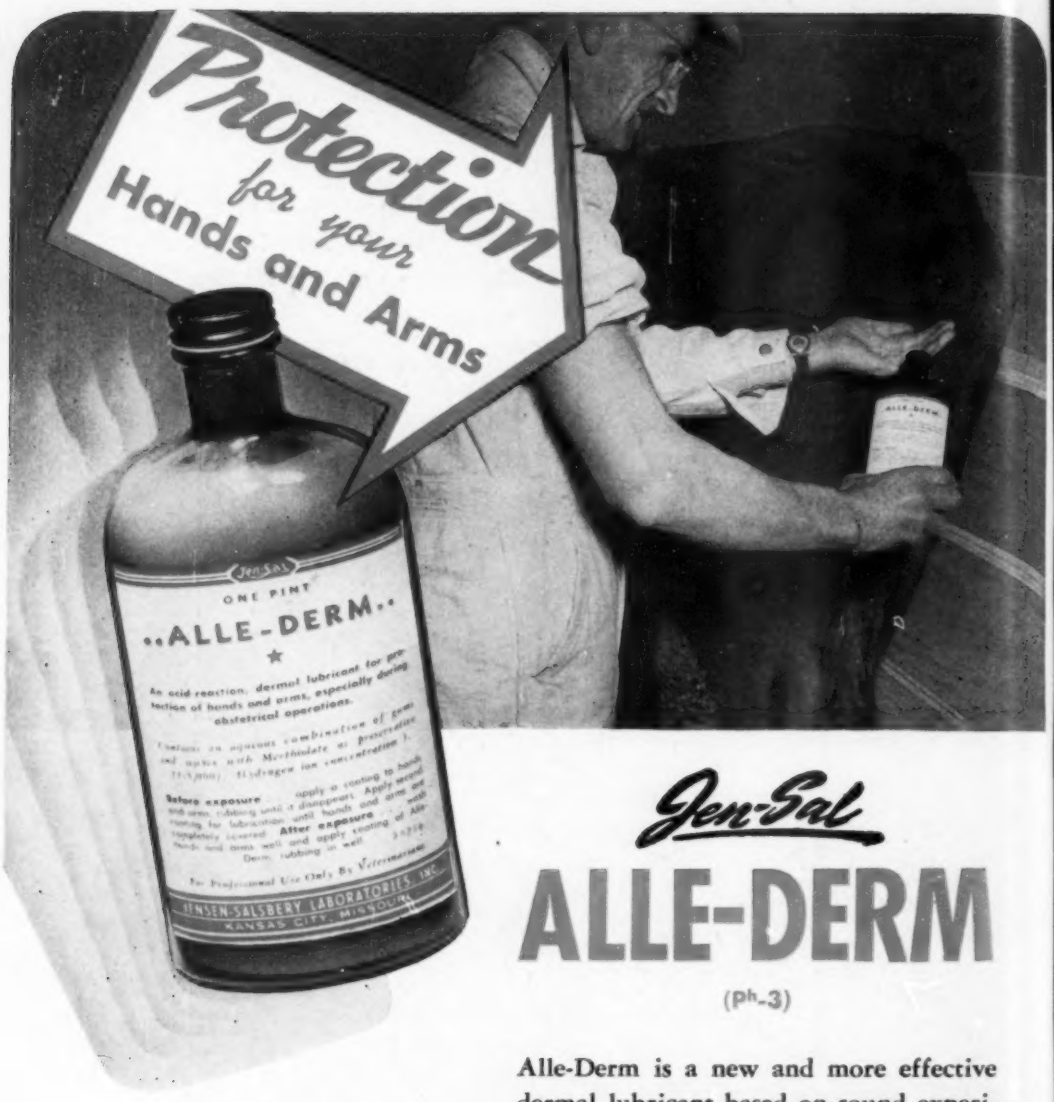
Colonel William H. Dean was born July 30, 1891, at Norton, Va. He received his degree of V.M.D. from the University of Pennsylvania in 1917, and on July 16 of that year was commissioned a second lieutenant in the Veterinary Corps. He was ordered to active duty Sept. 5, 1917, and during the next eight years served consecutively at the following stations: Camp Furlong, New Mex., Camp Pike, Ark., Fort Jay, N. Y., Camp Jackson, S. Car., Fort Benning, Ga., Camp Jackson, Tenn., and Jefferson Barracks, Mo. In 1925, he was ordered to duty at Fort Riley, Kan., where he served as Station Veterinarian and instructor until 1930. Colonel Dean is a graduate of the Cavalry School, Fort Riley, class of 1927, and the Army Veterinary School, class of 1932. Following a two-year tour of duty at Front Royal, Virginia, in 1934, he was sent to China. Upon his return from foreign duty, in 1937, he served at the Presidio of San Francisco, Calif., Western Remount Area Headquarters, San Mateo, Calif., and the 30th Veterinary General Hospital, Fort Bliss, Texas, until 1942. While serving overseas with the General Staff Corps, Headquarters Services of Supply, North African Theater of Operations, from 1942 to 1944, he was awarded the Legion of Merit for exceptionally meritorious conduct in the performance of outstanding service. He attained the permanent grade of colonel on August 3, 1943. In 1944, upon his return from overseas, he was assigned to duty at Headquarters Army Service Forces, Washington, D. C., and will be retired for physical disability on September 30, 1945.

Colonel Frank H. Woodruff was born May 6, 1893, at Ithaca, N. Y. He received his degree of D.V.M. from New York State Veterinary College in 1917. He was commissioned a second lieutenant in the Veterinary Corps on July 16, 1917, and promoted through the grades, attaining the permanent rank of colonel on Aug. 3, 1943. He is a graduate of the Army Veterinary School, class of 1925, and the Medical Field Service School the same year. Following a tour of duty in the Philippines from 1919 to 1922, Colonel Woodruff served at Camp Dix, N. J., Edgewood Arsenal, Md., and Fort Hoyle, Md. In 1929, he was assigned to duty in China, following which he was on duty at Fort Bliss, Texas, for four years. In 1935, Colonel Woodruff was assigned to duty with the Headquarters Third Corps Area as Corps Area Veterinarian, thence to Fort Sill, Okla., and Fort Oglethorpe, Ga., returning to Headquarters Third Service Command in August, 1942, as Service Command Veterinarian. He will be retired for physical disability on Sept. 30, 1945.

Veterinary Corps Officer Decorated

Major Albert F. Ranney, (Corn., '32), Montpelier, Vt., has been awarded the Bronze Star Medal for meritorious service in support of combat operations with the Third Armored "Spearhead" Division. His citation was received because he "not only was responsible for the veterinary service within the division, but in addition accepted the position as adjutant of the 45th Armored Medical Battalion, relieving a medical officer to do professional service which was urgently needed."

At times during combat Major Ranney acted as commanding officer of the medical battalion headquarters and headquarters company during long difficult movements and during bivouac. He was also responsible at times for the movement of over 100 remaining cases at the division convalescent and exhaustion center. At one time Major Ranney was division mess inspector with special reference to the conservation of food.



Jen-Sal ALLE-DERM

(Ph-3)

Alle-Derm is a new and more effective dermal lubricant based on sound experimental research which demonstrates that protein allergens are precipitated and rendered innocuous by contact with an acid medium.

Routine use of acid-reactive Alle-Derm before and after obstetrical operations minimizes risk of troublesome contact dermatitis.

Two-ounce sample bottle without charge upon request

Per pint . . $0.90

JENSEN-SALSBERY LABORATORIES, INC.

Kansas City Missouri